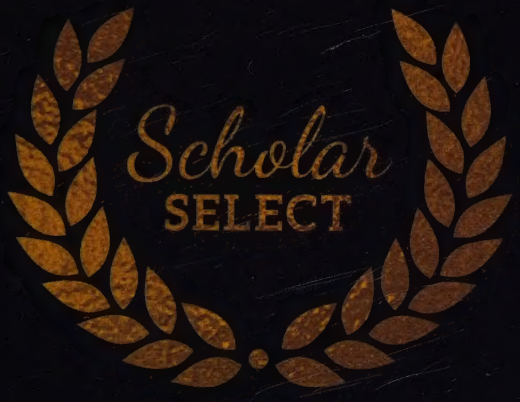
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THE RUDDER

EDITED BY

ARTHUR F. ALDRIDGE

Ship after ship, the whole night long,
With her battle-thunder and flame;
Ship after ship, the whole night long,
Drew back with her dead and her shame;
For some were sunk and many were shattered,
And so could fight us no more—
God of battles, was ever a battle like this in the world before?

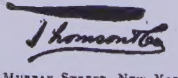
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VOLUME XXXIII

NEW YORK
THE RUDDER PUBLISHING COMPANY
1917

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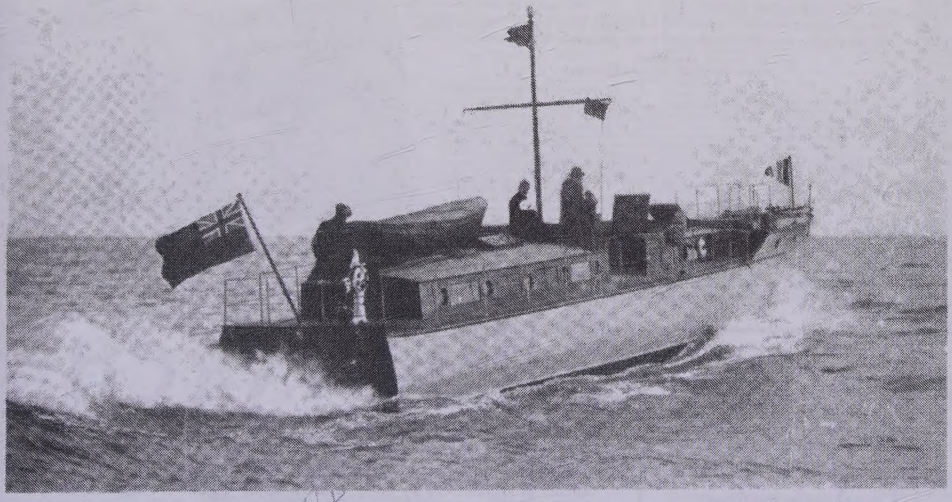
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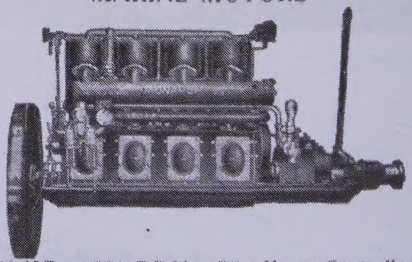
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U S S. TORPEDO-BOAT DESTROYER BENHAM

A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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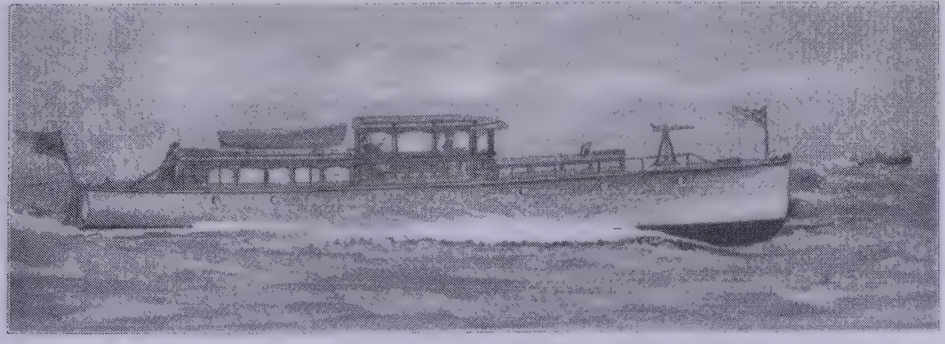
Volume XXXIII | January, 1917 | No. 1

Fine Racing Outlook at Miami

FOR several weeks yachts of varying sizes have been heading South, carrying their owners and guests to warmer climes, to the land of perpetual Summer. The smaller craft generally went by the inside route which took them through scenes at times picturesque and then drear and desolate. These scenes were always interesting and seldom monotonous. Other and larger craft dared the ocean and made the best time to some Southern port from which the Winter cruising began. Miami is the headquarters of all yachts going South. Other ports are visited, but sooner or later Miami, the objective, is reached, and from Miami cruises are made in all directions. Many of the experienced yachtsmen visit Miami first because they say that there they find really warm weather, while at some of the cities on the Atlantic coast it is bleak and uncomfortable. Then having avoided the discomforts of the Winter they start North as the sun's rays grow more heated and finally arrive home in the Northern latitudes when the Winter has disappeared.

Miami is a center of attraction, too, because there the first racing events of the New Year are held and the third annual Miami regatta promises to far excel its predecessors. Carl G. Fisher, of Indianapolis, is the chairman of the committee in charge and it has been through his efforts that power-boat racing at Miami has grown so much in popularity. Profiting by his experience at former regattas, Mr. Fisher has worked out a program of events which has appealed not only to owners of small racing boats, but to owners of high-speed cruisers who will take part in several long-distance events. Mr. Fisher has had much experience in racing, having first been interested in the Indianapolis Speedway, devoted to automobiles, and consequently he has learned not to overlook small details, and when the first gun is fired for the opening event all arrangements will be so perfect that things will almost run themselves. Then, too, Mr. Fisher does not ask anyone to do what he will not do himself, and he has been a liberal supporter of the racing game. He has this year added two boats to his racing fleet.

The Third Annual Miami Regatta, which will attract hundreds of visitors from all parts of the country, will begin on Thursday, January 18th, and continue on the two following days. Then on each of the six following Saturdays a long-distance race will be started. The first



Shadow III, Carl G. Fisher's New Express Cruiser, Built by the Purdy Boat Company, Equipped With Two 8-Cyl. Speedway Engines Developing 220-H.P. Each—Speed About 31 Miles per Hour

of these, on Saturday, January 27th, is to Key West, a distance of 161 miles. The second is to Palm Beach, a distance of 65 miles. The third is from Palm Beach back to Miami. The fourth is to Gun Key Light and return, right straight out across the Gulf Stream, a distance of 110 miles. The fifth is from Key West to Miami. The sixth is from Miami to Nassau.

The first three days of the regatta will be replete with unique features. All races during these three days will be held in full view of the specially constructed grandstand, located right on the Bay of Biscayne. The race course itself is an oval, 2½ miles around, and those on the grandstand can see every inch of the contest. The start and finish of each event is in front of the grandstand. The races start the first day at 2:00 p. m., opening with a free-for-all race for open displacement boats, distance 15 miles. The next race will be called at 2:45 p. m., and will be for express cruisers with a qualifying speed of 20 miles per hour, distance 10 miles. The third event will be for aquaplanes, called at 3:30 p. m. The second day the open displacement boats will have to go 10 miles, the express cruisers 15 miles, the races being called at the same time. On Saturday, the third day, the open displacement race will start at 1:30 p. m., and will be for 20 miles. The express cruiser race will start at 1:30 p. m. and will be for 20 miles. The aquaplane event will be held at 3:15 p. m. on Saturday.

The races during these three days will be run on the point system, each day's race acting somewhat as a heat. Each boat gets a point for finishing and a point for every boat she beats, so the winner is not really known until the last day, which materially adds to the excitement. The long-distance race schedule for each Saturday and starting Saturday, January 27th, will be sent away from the Biscayne Bay Y. C. at 9:00 a. m., when scheduled from Miami; from the pier head at Palm Beach for the Palm Beach-Miami event, and from the Quarantine Station at Key West for Key West-Miami event.

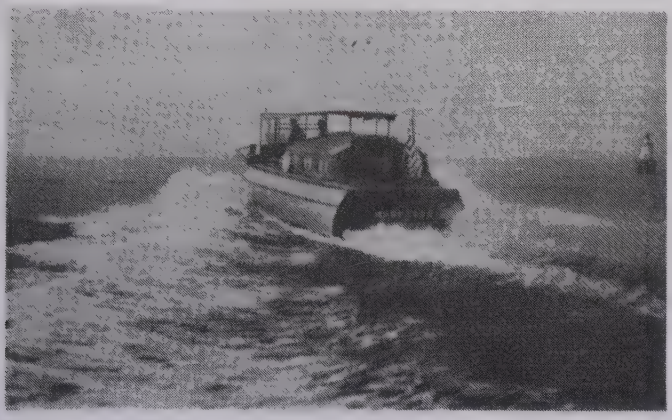
Some remarkable boats will take part in these races, and it is fully expected that new world records will be established, despite the fact that two new records were made at Miami last year, one by Betty M and the other by Boomerang. Since that time, Countess has lowered both records by winning the Block Island Race of 116 miles at an average speed of 27.69 m.p.h., and by winning the 187-mile race from New York to New Bedford at just about the same speed. Countess is a 40-foot express cruiser designed and owned by Wm. H. Hand, Jr., and powered with an eight-cylinder, 6 by 6-inch Van Blerck. Countess is capable of just a little better than 30 miles an hour in a straightaway. At this writing negotiations are now practically completed whereby Countess becomes the property of a well-known Miami yachtsman, who is getting the boat purely for the pleasure of entering it in the Miami regatta and in the six long-distance races.



Whippet, Oliver Gould Jennings's 60-Foot Express Cruiser. Built by the Greenport Basin & Const. Company. Equipped With Two 8-Cyl., 6 x 6 In. Van Blerck Engines. Speed 27 Miles

Shadow III and Raven III are the names of two new boats built for Carl G. Fisher. These two were built by the Purdy Boat Company at a temporary shop at Indianapolis and were shipped South and tried out by the Purdy Company at Miami. The general dimensions of these boats are 50 feet long, 9 feet breadth and 2 feet 4 inches draught. Each is equipped with two eight-cylinder Speedway engines of 220 h.p. each. The estimated speed is 31 miles an hour and the fuel capacity is sufficient to give a cruising radius of 250 miles. Forward is a storage space which is followed by the crew's quarters. Next aft is the engine space and then comes the galley, cabin and cockpit. A feature of these boats is a deck shelter amidships, which is detachable at the height of the window sills, and when the upper part is off, leaves a spacious bridge deck, with coaming waist high, and does not detract from the artistic appearance of the yachts. This shelter can be attached or detached in ten minutes. The steering gear and all engine controls are operated from the shelter. Another feature is the ice-box which is under the settee in the deck shelter, which is fitted with cold storage chambers and is accessible from the deck shelter and from the galley. All the cabin and running lights are electrically lighted. Hoisting slings are also provided forward and aft. These are attached to transverse bulkheads and make it easy to lift the boat at an overhanging wharf or bridge, making it easy to repair propeller wheels, etc.

Another remarkable boat, and one that most of Miami's yachtsmen are rooting for, is Boomerang II, owned by Huston Wyeth, president of the Blue Valley



Marpessa, 50-Foot Express Cruiser, Owned by W. J. Matheson. Built by the Mathis Yacht Building Corp. Designed by T. E. Taylor. Two 8-Cyl., 6 x 6 In. Van Blerck Engines. Speed 35 Miles

of Detroit and Miami, was the winner of the express cruiser races last year. This year he has a new boat, Betty M IV, a 48-footer with lots of accommodations, also lots of speed. This new boat was tested out on the Detroit River in November and then immediately shipped South. No reports could be obtained of the speed she made. She is powered with a pair of six-cylinder Van Blercks and was designed by Carlton Wilby and built by Church Boat Company. Betty M, that won the big race at Miami last year, was also a 48-footer with the same power, by the same designer and same builder as the new boat. She is now owned by Walter E. Flanders, who rechristened her Hazel F. It is fully expected that Hazel F will defend her title in January.

Butter Company and the Wyeth Hardware Company, of St. Joseph, Mo. He purchased the big residence built for the late B. F. Keith, at Miami. Boomerang II is the second boat of that name now owned by Mr. Wyeth, the first Boomerang ran second in the express cruiser race last year and won the 161-mile race to Key West. The new boat is 53 feet long, has a pair of 200-h.p. eight-cylinder 6 by 6-inch Van Blercks, was designed by A. Loring Swasey, and is capable of sustaining a speed of 32 miles an hour. Both the Boomerangs will be entered in the express cruiser races and in the long-distance races.

Mauna Loa is another spectacular boat that is expected to reach Miami in time to take part in all the races scheduled. Mauna Loa is owned by Mrs. Arthur Curtis James, of Newport, New York and Palm Beach. It is a 55-footer built by Lawley and powered with a pair of six-cylinder Van Blercks that drive her fast enough to make it a mighty hard proposition for any other boat to keep up with her.

H. C. Good, of Moline, Ill., has a fast one in Marguerite II, a 40-footer powered with a six-cylinder Van Blerck that he expects to be able to win several of the long-distance races with. He admits he hasn't got quite enough speed for the races on the Biscayne Bay race course, but he has a boat that will prove a hard one to beat in the races across the Gulf Stream and the races to Key West and return. Marguerite II has the accommodations of a small house, being able to sleep six persons in comfort.

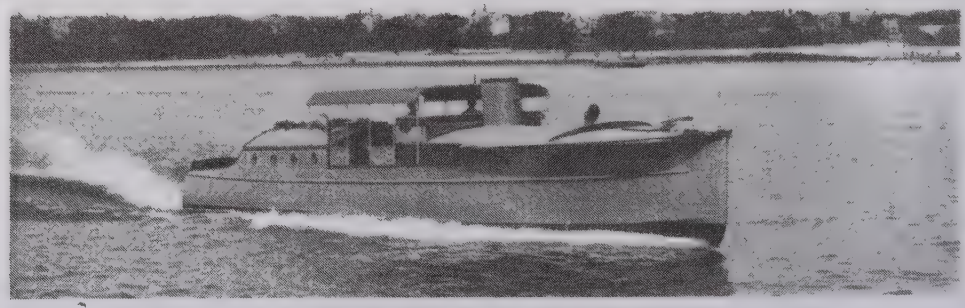
Commodore C. W. Kotcher.

Rosemary, a duplicate of Wm. H. Hand's Countess, went South early in November, and will be a contestant in the various events at Miami. She is owned by Geo. D. B. Bonbright, of Rochester, N. Y., and Daytona, Fla. Rosemary is a 40-footer, powered with an eight-cylinder Van Blerck, which gives her a speed of just about 28 m.p.h.

Whippet, the spectacular 60-footer owned by Oliver Gould Jennings, of Newport, New York and Palm Beach, is after some of those prizes offered by Carl Fisher and his committee. Whippet is powered with a pair of eight-cylinder, 6 by 6-inch Van Blercks that give her a speed of 27 m.p.h. Whippet is a duplicate of the war-boats



Mauna Loa, Mrs. Arthur Curtis James's 55-Foot Express Cruiser. Two 8-Cyl., 5½ x 6 In. Van Blerck Engines. Speed 25 Miles. Built by Geo. Lawley & Son Corp.



Marguerite II, 40-Foot Great Lakes Boat Building Corporation Military Type Express Cruiser. Owned by H. G. Good. 6-Cyl., 6 x 6 In. Van Blerck Engine

built by the Greenport Basin & Construction Company for the Russian Government. The only difference between the Whippet and the war-boats is that the latter boats have three of the eight-cylinder Van Blercks installed.

W. J. Matheson, of New York City, has a beautiful home at Cocoanut Grove, Fla., close to Miami. His new boat, Marpessa, is 50 feet long, 10 feet breadth and 2 feet 6 inches draught, and is powered with a pair of six-cylinder Van Blercks that drive her quite fast enough to keep company with the fastest boats that will take part in the Miami regatta.

Henry Ringling, of circus fame, has just shipped South his new 45-footer designed and built by the Great Lakes Boat Building Corporation, of Milwaukee, and powered with an eight-cylinder, 6 by 6-inch Van Blerck. Salome is a splendid type of boat, one in which Mr. Ringling can take long cruises, and a boat that will be hard to beat in the long-distance races to be held from Miami this Winter.

E. L. King, of Winona, Minn., and Daytona, Fla., has had built a boat especially to take part in these races. The new boat has been christened Kingfisher, and is 56 feet long, 11 feet breadth, 28 inches draught, and is powered with a pair of six-cylinder, 6 by 6-inch Van Blercks. This boat was designed and built by the Great Lakes Boat Building Corporation, of Milwaukee, and is one of the most palatial of the yachts that will take part in the big Miami regatta.

James Deering, of Chicago and Miami, recently wrote from Paris, France, entering his new speeder Psyche in all events for which she is eligible. Psyche is a 44-footer powered with a pair of six-cylinder, 5¾ by 7-inch Speedways, and has a speed of 29 actual miles. She was designed and built by the Gas Engine & Power Company and Chas. L. Seabury & Co., Consolidated.

Nicholas W. Metzner, of Rockledge, Fla., and New York City, will have a 40-footer in all the races that is scheduled to be a world beater. No definite data has yet been released on this boat. Mr. Metzner had a little 30-footer in the open displacement class last year that pulled down third money. Glenn H. Curtiss, of the Curtiss Aeroplane Company, will furnish further excitement, as he has established a school at Miami and demonstration flights will be made during the regatta; in fact, throughout the season.

Charles Deering has entered the Sayonara, a 60-foot cruiser having a breadth of 10 feet 6 inches and draught of 3 feet 6 inches. This yacht is driven by two six-cylinder, 8 by 8-inch Speedway engines.

O. J. Mulford has also entered a yacht which is equipped with Gray engines which is expected to be very fast.

Another attraction has just been added to this fine program. There is to be a race from Miami to Nassau, New Providence, in the Bahamas, a distance of 250 miles. This race is for express cruisers capable of a sustained speed of 20 miles an hour. Mr. Fisher is looking for a fleet of at least twelve boats in this race. The race will be started in February.



Boomerang II, 83-Foot Express Cruiser, Designed by Swasey; Built by Robt. Jacob for Huston Wyeth. Two 8-Cyl., 6 x 6 In. Van Blerck Engines. Speed 32 Miles

Yachtsmen and Naval Reserve Bill

EFFORTS are being made to amend the law passed by Congress last June creating a Naval Coast Defense Reserve, and a bill is to be introduced in Congress shortly for the Navy Department which will, if passed, remove some of the features of the present law which are objectionable to yachtsmen and yacht owners.

Under the present law owners and operators of power yachts suitable to naval purposes in defense of the coast may be enrolled in what is known as the Naval Coast Defense Reserve, Class 4. Contracts may be made with these owners to take over their boats in time of war or national emergency upon payment of a reasonable indemnity. It is required that these owners, or others wishing to join this Naval Coast Defense Reserve, must be willing to enroll for four years and during that time to put in not less than three months of service. This active service may be in one period or in periods of not less than three weeks each year. Officers on joining, will be given a provisional rank or grade on passing an examination, and after the three months of active service have been completed this provisional rank will be confirmed. Officers and men are to receive provisional retainer pay and after the confirmation to receive annual retainer pay.

This four-year enrollment has created a stumbling block in the establishment of this Coast Defense Reserve. Yacht owners last Summer showed their willingness to help in any preparedness movement and nearly 200 power yachts were enrolled in the effort to establish a reserve fleet, and many who did not own power boats agreed to take part in maneuvers which were successfully held at four different parts of the coast.

Since then new organizations have been formed, such as the Power Craft Association and the Volunteer Power Boat Association of Long Island, but the members of these two associations do not favor enlisting with the Government for a period of four years, for that is what it practically means, and being subject to call for service at any time. These owners have in mind the recent experiences of the members of the National Guard.

Several members of the Power Craft Association and members of other organizations went to Washington on December 7th to a hearing before Franklin D. Roosevelt, Assistant Secretary of the Navy. Among those who attended this hearing were: Henry S. Beardsley, Robert B. Roosevelt, Horace E. Boucher, Ferdinand S. Crosley, Major Alfred R. Whitney, Jr., Leonard H. Dyer and William Greenough. Rear-Admiral L. C. Palmer, Chief of the Bureau of Navigation, under whose charge the naval reserve is being formed, and Captains Marvel and McGruder were also present.

Mr. Beardsley acted as chairman of the civilian committee and he made a long presentation to Mr. Roosevelt, first pointing out how the associations of power-craft owners and operators were formed, growing directly



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Pattina, 60-Foot Express Cruiser. Designed and Built by Luders Marine Const. Company for Sir Charles Ross, of Quebec. Two 8-Cyl. Duesenberg Engines, Which, at 1,500 Rev., Develop 456 H.P., Giving a Speed of 26 Knots on Trial Trip. Guaranteed Speed 25 Knots



65-Foot Russian Patrol Boats, Lying in the Basin, Somewhere in Russia, Where They Were Built, Preparatory to Trial Trips

from the interest taken in the so-called power-boat maneuvers last Summer.

It was pointed out that the Navy Department and yachtsmen, power-boat owners and operators were working together for a common purpose in the interest of the Nation. It was also stated that the purpose of the Power Craft Association and others of similar character was to secure for the country in time of danger the services of men, who, on account of their own practical experience on the water, have gained an ability and knowledge of a kind which is particularly valuable at this time in view of the newer developments in modern warfare.

"It is of vital importance to the country that this movement be a great and complete success," continued the representative of the civilians. "To make it so requires the enrollment of the ablest men and the greatest possible number of competent and efficient men who fall under the classification with which we are concerned. These are mainly men in the prime of life and as a rule of the most intense professional or business activity. A large proportion of them are executive heads of the enterprises with which they are identified and include those who are among the foremost in the affairs of the country. As a type they are of more than ordinary initiative, force and responsibility. These qualifications, together with the experience of this class of men upon the water, combine to make them of very great value in the service of the country when they have received such additional training as would fit them for active duty."



One of the Russian Patrol Boats on Trial Trip, Showing a Speed of 21 Knots. Driven by Three 8-Cyl., Model F Sterling Engines of 150-200 H.P. Each



U. S. S. Pennsylvania, Leaving New York Navy Yard for Rockland, Me., for Her Speed Trials

It was urged that every obstacle to enrolling be withdrawn and a premium be put on efficiency, and that efficiency rather than time be the measure of service.

It was suggested that the bill be amended so as to constitute the period of enrollment one year, and the amount of service two consecutive weeks afloat, and three full days of service and instruction on land to be taken between January 1st and the period of Summer service, and three full days of service and instruction on land to be taken after the period of service afloat and before the succeeding January 1st.

The reason for this suggested change is that it will be difficult for many men to agree to enroll for more than one year at a time. In the event of war, the men who will join this movement are those who are willing to make any sacrifice, yet in times of peace it would be difficult for them so to arrange their affairs as to make certain that more than one-year enrollment for practice at one time can be given.

It is recommended that for the first year of service a certificate be given by the Navy Department and then, as an added inducement for an additional year of enlistment, that it be made necessary to serve such an additional year in order to secure rank and rating.

The question of enrollment of yachts was then taken up and it was pointed out that some owners have indicated their intentions of building to the Department's type and that by next season several vessels will have been built. It was urged that some proper provision be made for the enrollment of these boats, by enlarging the Volunteer Naval Reserve and taking into that reserve members of the Naval Coast Defense Reserve. These members will enroll for one year, but will not be entitled to any retainer pay, allowance or gratuity, unless they shall at their request be transferred to the Coast Defense Reserve. Power craft may be tendered for enrollment for one year, the owners agreeing to present their craft for drill or maneuver for a period of not more than two weeks in such year. The Department is to furnish fuel, lubricating oil, arms and ammunition free of expense to the owner.

After discussing the Reserve the committee turned



U. S. S. Superdreadnought New York Passing Down the East River, Under the Brooklyn Bridge, for Her Speed Trials Off the Virginia Capes. The Impressive Skyline of New York, With the Woolworth Building, the Highest in the World, Forming the Background



Rosemary, 40-Foot Express Cruiser. Owned by Geo. D. Roubright. Sister Ship of the Countess, Designed by Hand, Built by Lawley, and Driven by an 8-Cyl. Van Blarck

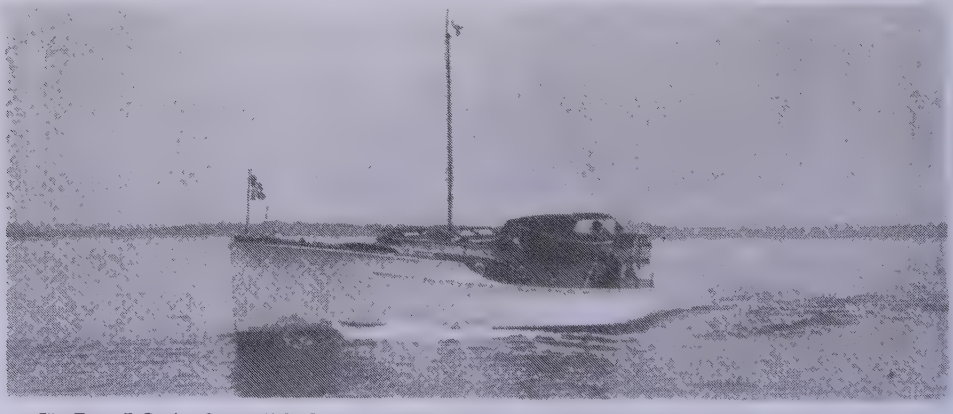
its attention to the recommendations made in the report of Rear-Admiral Knight. This was published in THE RUDDER of last month. It provided for boats of two sizes, 40 and 60 feet, these to be divided into fast and slow divisions, having speeds varying from 7 to 16 knots. The committee suggested the creation of a class to consist of boats not less than 35 feet in length and with a minimum speed of 7 knots. This suggestion was made in order that there may be secured for the service of the country a type of men, perhaps in the majority of cases younger men than the owners of large boats, but men of experience on the water and who, when trained, will prove to be material of the greatest value.

Under the heading of personnel it was urged that it might be advisable that the provision "all personnel shall be enrolled in the Naval Coast Defense Reserve" be amended to exclude from this provision paid professionals on yachts or power boats, such as sailing masters, engineers, cooks, seamen, etc., as the difficulty in securing the enrollment of such men would no doubt add a very serious problem to the yacht or power-boat owner and might for that reason interfere with the free enrollment of owners with their craft. Other suggestions were made relating to personnel, training, signaling and organization which will receive the attention of the Department.

Franklin D. Roosevelt, who is enthusiastic about the formation of these power-craft reserves and enlisting the services of the yachtsmen, thanked the committee for its work and its suggestions, many of which he frankly admitted were good. He appreciated the difficulties that would arise in trying to get yacht owners to enroll for four-year periods and is anxious that all difficulties in the way of enrollment may be smoothed away, and the Naval Coast Defense Reserve and the Volunteer Naval Reserve be developed to a high state of efficiency and become powers for the country's defense in case of hostilities.

The committee then conferred with Captains Marvel and McGruder, who both appreciated the owners' arguments as against those of the Navy Department's four-year enrollment, which would be hardship and work against the success of the movement.

The civilian committee, after returning to New York, met and framed a letter which embodied the suggestions of the committee on changes that should be made in the



Zita, Horace E. Boucher, Owner. 40 Ft. Long, 11 Ft. Breadth and 2 Ft. 9 in. Draught. Power, 4-Cyl., 6⅝ In. x 7 In. Lamb Engine
See May, 1916, Issue, for Plans and Description

present law. This letter, signed by H. S. Beardsley, as chairman of the Legislative Committee of the Power Craft Association, and addressed to Franklin D. Roosevelt, Assistant Secretary of the Navy, follows:

After appearing before you at the public hearing in the library of the Navy Building on December 7th, the Committee on Legislation of the Power Craft Association, representing yacht and motor power-boat owners and operators, had conference with Captain George R. Marvel, U. S. N., and Captain T. P. Magruder, U. S. N., as was suggested by you at the adjournment of the public hearing. As a result of our conferences with Captain Marvel and Captain Magruder, we respectfully recommend the following three amendments to H. R. 15947, the present law governing the Coast Defense Reserve:

1st. That under the classification "Volunteer Naval Reserve," specific provision be made for the enrollment, active service and recognition of service of yacht and power motor-boat owners and operators and others in this class as follows:

Enrollment to be for one year; active service during such year to consist of two weeks afloat and six full days (but not consecutive) ashore; in order to qualify for a certificate at the conclusion of the first year; and that a second enrollment of one year, not necessarily immediately following the first year's enrollment, to be a prerequisite to confirmation in grade, commission, warrant, etc.

2d. That members of this class are not to be entitled to any retainer pay, allowances or uniform gratuities, unless or until they, at their own request, shall be transferred to one of the other classes of the Naval Coast Defense Reserve and enroll for the period of four years as provided in this act for such other classes.

3d. That under the provision of the Bill for supplying gasolene and lubricating oil, the word "fuel" be substituted for the word "gasolene."

The reasons which impel us to recommend these amendments are fully set forth in a memorandum prepared by the Legislative Committee and submitted at the public hearing before you on December 7th.

We earnestly suggest that the amendments be adopted, if possible, at the present session of Congress, as the season is at hand for the building of boats for the coming Summer and as no time should be lost in preparing the ground for the largest possible enrollment in this class for next year's active service. If it is feasible, the Committee would very much like to see a copy of the amendment after it has been drawn up in the proper legal form, and a member of the Committee would be glad to again visit Washington for consultation with your Department if such should be desired.

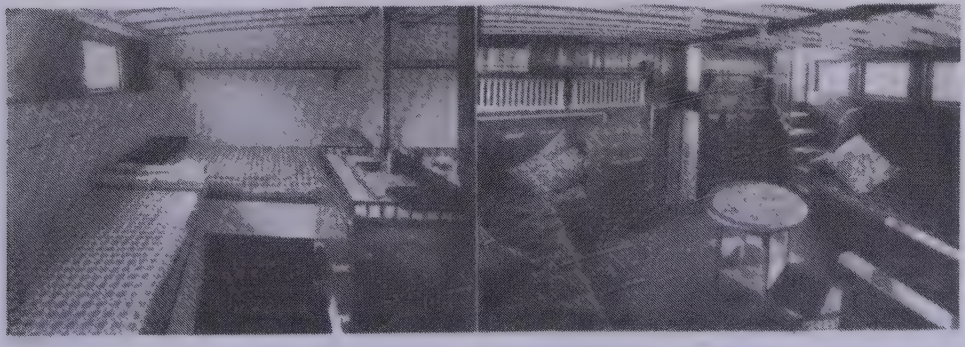
Power Houseboat Harmar

THE Harmar recently arrived in Florida, after being delivered by the New York Yacht, Launch & Engine Company, her builders and designers, to Harold Weston. The Harmar is 65 feet over all, 16 feet breadth, with a draught of 30 inches, and designed and built after the ideas as expressed by Mr. Weston. She is driven by two four-cylinder, 6½ by 8½, 40-50-h.p. 20th Century kerosene engines, which give her a speed of about 10 miles an hour.

The Harmar is a very heavily constructed boat with heavy oak keel framing, and is planked with white cedar. The interior is laid out with large saloon forward and two double staterooms. The bathroom is on port side. The dining room is amidship with the galley on the starboard side partitioned off. The engine room and crew's quarters are aft. The boat is fully equipped in every way, having a Delco electric light plant with searchlight and American radiator water heating system. The plumbing is of Curtiss make and is up-to-date. The boat is beautifully upholstered and decorated. The interior finish of the forward saloon is raised paneled mahogany, and in staterooms and dining saloon, white enamel with mahogany trim. The deck is one of the features of this boat.

The Harmar is built on the same general plan as the yachts Marold, Maris and Wissoe, which the New York Yacht, Launch & Engine Company have built in the past three or four years and which have been so well liked and such practical boats for Florida as well as Northern cruising, all of them having wide beam, which gives large deck space and excellent interior accommodations.

This yacht is one of the latest developed for Southern cruising. One of the main features being the large square windows in the sides of the vessel, affording plenty of light and ventilation even in the hottest weather. Wire screens are also fitted to each window.



Interior Views of the Power Houseboat Harmar

Sabalo, W. Earl Dodge's New Yacht

SABALO, William Earl Dodge's new power yacht, is now in Southern waters. She made the run from New York to Miami in 70 hours, which gives some indication of her speed and seaworthiness. Sabalo will be the center of attraction at every port she visits this Winter because she is the last word in yacht design and construction and is one of the most attractive yachts built. Tams, Lemoine & Crane designed the yacht. It was built by the George Lawley & Son Corporation, at Neponset, and is equipped with three 300-h.p. Speedway engines. Slowly but surely the gasolene engine is driving the steam engine from the large yachts, and the Sabalo is another example of what can be obtained in the way of accomodation in a comparatively small vessel because of the economy of space in the engine compartment. On this vessel there are no boilers, no coal bunkers, and she can be handled by a much smaller crew than could a steam vessel which has the same amount of quarters for the owner and his guests.

Mr. Dodge, her owner, is an enthusiastic yachtsman. He has owned yachts for several years and these have been sailing craft, his present racing yacht, the 50-foot sloop Samuri, high-speed boats, notably the Pampero and Minnow, and cruising craft, the best known of which was the Alacrity. With his experience with these different types and with other vessels Mr. Dodge carefully figured out just what he wanted, with the result that Sabalo has been built and is now in commission.

This yacht is 140 feet 5 inches over all, 130 feet on the water-line, 19 feet 6 inches breadth, 11 feet 5 inches depth and 7 feet draught. In model she resembles a modern torpedo-boat destroyer, having a plumb stem and raised forecastle deck. The stern of the destroyer is not pleasing for a yacht, and so Sabalo has an elliptical steamship stern designed just to suit her.

The hull is built of steel and is divided by seven watertight bulkheads. Her deckhouses are also of steel. The deck is of white pine and all deck trimmings are of teak.

The owner's quarters occupy 34 feet of the after part of the vessel and 13 feet of the forward part. The dining saloon, which is on deck, is 10 feet long and 14 feet wide. The saloon in the after deckhouse is 18 feet long by 11 feet wide. The bridge deck is 12 feet 6 inches long and the after deck is 17 feet by 14 feet, which does not include the large lounging seat in the stern, which is 6 feet wide.

Companion stairs in the after deckhouse lead into a small vestibule below. Forward is the owner's stateroom, which is furnished with a brass bedstead, sofa seat, bureau, chiffonier, desk, clothes closets, etc. Communicating with this room on the port side is a bathroom and on the starboard side a huge wardrobe. Aft of this is another stateroom the full width of the yacht and in the stern is still another stateroom on the port side and a bathroom on the starboard side. The dining room and galley are in the forward deckhouse, and below is a large stateroom the full width of the yacht with bathroom adjoining.

The crew's quarters are very commodious. On the main deck are rooms for the captain and engineer, officers' bathroom in which is a shower, officers' messroom and lots of locker room. Below is the steward's room, the mate's and assistant engineer's rooms and the crew's quarters. The headroom throughout the whole yacht is nowhere less than 8 feet.

The engine room is amidships and in this space are fifteen different engines. Three of 300 h.p. each are for propelling the vessel and the others for hoisting launches, getting up anchors, heating, lighting, ice-machine and cold storage plants, refrigerators, etc. There is a 12-k.w. generator set for the lights, fans, auxiliary pumps, electric switches for hoisting the boats, and in addition, a 7-k.w. combination set for running the air compressor, bilge pumps and other auxiliaries. The yacht also has a complete set of Edison storage batteries with 100-cell capacity, which is used chiefly for heating. There is a one-



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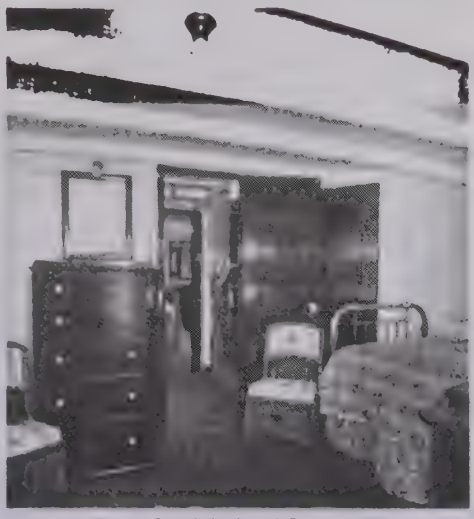
Sabalo, 140-Foot Torpedo-Boat Destroyer Type of Yacht

ton ice-machine with a large refrigerator in the hold which is divided into two compartments and a small refrigerator in the pantry.

The three engines can be used together or separately. Each drives a separate propeller. When high speed is wanted, all three engines are used; while cruising offshore, two are used, and for following races and just puttering around, the middle engine is used. The tank capacity is 9,000 gallons of gasolene, which gives the yacht a cruising radius of 2,000 miles. Sabalo carries a 21-foot power tender which can make about 16 miles an hour, a 16-foot crew's launch and a power dinghy. These small boats were built by the Gas Engine & Power Company.

The decorations are very artistic. The decorative scheme is Colonial style and the chairs, tables, sideboard in the dining room, the furniture in the social hall and staterooms were all made from special designs for this yacht. The ventilation has been very carefully worked out and each room has direct ventilation by means of skylights. In the engine room, too, there is direct ventilation and the headroom in that compartment is more than 10 feet. The lighting scheme is artistic. The indirect system has been used everywhere and the fittings are tastefully designed and arranged.

Mr. Dodge will cruise in Southern seas this Winter, and in the Spring will come North in time to participate in the yachting season in these waters.



Copyright Levick **One of the Guests' Staterooms**



Copyright Levick **The Commodious After Deck of the Sabalo**



Copyright Levick **Engine Room of Sabalo, Showing the Three Speedways. There Are Also Twelve Auxiliary Plants**



Copyright Levick **The Owner's Stateroom**



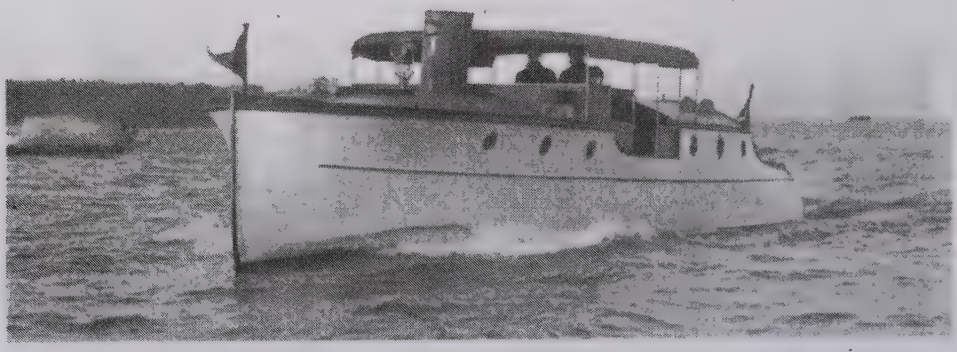
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Dining Room in the Forward Deckhouse



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Smoking and Music Room in the After Deckhouse



Salome, Henry Ringling's Semi-Tunnel Stern Express Cruiser. Designed and Built by the Great Lakes Boat Building Corporation One 8-Cyl., 6 In. x 6 In. Van Blerck. She Will Be Used for Fishing as Well as Racing

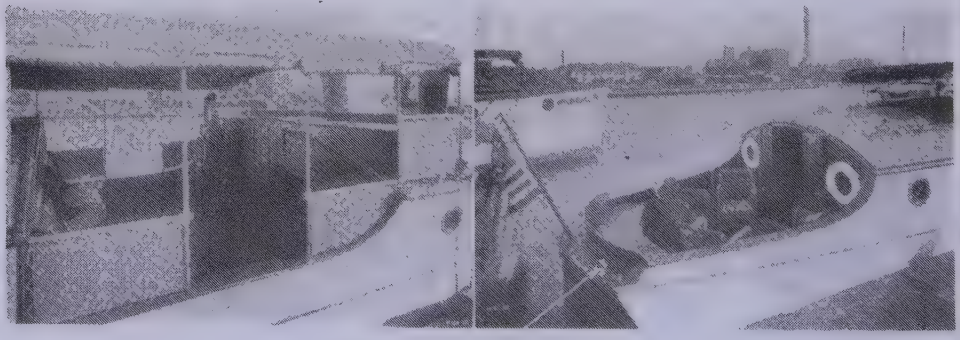
Henry Ringling's Fishing Boat Salome

SALOME is a 43-foot cruiser which Henry Ringling, one of the seven Ringling brothers of circus fame, has had built for fishing and cruising in Florida waters, and which will in all probability take part in some of the long-distance races at Miami. The yacht is a shallow-draught semi-tunnel express cruiser, and was built by the Great Lakes Boat Building Corporation. In appearance, Salome much resembles the military type express cruisers which have been developed by her builders. The draught has been reduced to 23 inches by semi-tunnel construction, which is rather remarkable, as the yacht has sleeping accommodations for six persons and equipped with an eight-cylinder Van Blerck engine can make 22 miles an hour.

The hull is divided into four compartments—crew's lavatory, galley, main cabin and owner's stateroom, each with full headroom throughout, and has besides a commodious bridge deck and inviting cockpit. Structurally, the boat is strong without excessive weight, as the hull is designed for sawn frames, steam-bent ribs and battens running from stem to transom, all spaced on short centers. There are two watertight bulkheads which add not only safety but also strength and rigidity. The hull throughout is fastened with brass screws and copper rivets.

The crew's lavatory is in the fore part of the hull and is separated from the galley by a watertight bulkhead. The galley is very complete, having an ice-box which extends the entire width of the hull; a two-burner range with oven; and sink with running water, and ample locker and rack space. The forward cabin is finished in mahogany and provided with extension type seats of box-spring construction. The upholstery is a brown plaid of imported material, which not only harmonizes with the interior finish, but also has the merit of being waterproof.

The engine, under the bridge, is completely housed and protected, and yet each part is made instantly accessible by means of specially designed removable hatches built in sections. All controls are carried to the steering column for one-man operation. The deck makes a very comfortable lounging place, as it is provided with two upholstered seats and can be entirely enclosed by side curtains in inclement weather.



The Bridge Deck and After Cockpit of the Salome

In the after cabin, or owner's stateroom, extension type seats, with spring cushions handsomely upholstered, are provided, forming when extended a comfortable bed on each side. At the forward end of the cabin a completely-equipped lavatory is provided on the port side and a large clothes locker on the opposite side. The cockpit, which adjoins the owner's stateroom, is a most inviting and enjoyable lounging place, in fair or heavy weather.

Mr. Ringling has spared no effort to make his boat very complete, and has included such equipment as a special Delco light plant, 7-inch searchlight, bronze, double-acting windlass, electric fans, electric ship clock, and other fittings of the highest grade. The cruiser, with its mahogany trim throughout, attractive upholstering, and special fittings, represents one of the finest boats that has been built this year.

Venetian Maid Has Speed and Comfort

VENETIAN MAID, L. W. Tuller's new yacht, has been called an express cruiser de luxe. She is certainly one of the most attractive yachts of the Great Lakes fleet and in addition to having fine accommodations, has speed. She can make 27 miles an hour. There are three of this type all built from designs by Carlton Wilby. They are painted black and are very similar in appearance, the differences being only a few feet in length. The other two are Commodore Charles W. Kotcher's Betty M. II, and Commodore C. B. Lockwood's Ouananiche. The latter is 65 feet long, while the other two are each 60 feet.

Venetian Maid has so pleased the yachtsmen of the Great Lakes that it is very probable that others will be built this Winter. She was built by the American Boat Company at Detroit, and her general dimensions are 60 feet long, 10 feet breadth and 3 feet draught. She is equipped with two 5½-inch by 6-inch Van Blerck engines which operate 22-inch by 24-inch Columbian wheels at 1,325 r.p.m.



Venetian Maid, Express Cruiser De Luxe

Mr. Tuller is an enthusiastic yachtsman and in the past season he has used Venetian Maid a great deal as a day cruiser in the waters near Detroit, but he has also made some extended trips on Lake Erie as far as Georgian Bay and to upper Lake Michigan points.



Venetian Maid, L. W. Tuller's Express Cruiser. Designed by Carlton Wilby and Built by the American Boat Company
One of the Most Attractive Yachts on the Great Lakes



H. V. Schieren's Day Cruiser Ahdeek on Great South Bay

Ahdeek, An Attractive Day Cruiser

THE Ahdeek, a Seabury express day cruiser built for H. V. Schieren, was one of the best-known and most prominent boats used in the Great South Bay last Summer. These waters are literally filled with power craft of all types and descriptions, but for the most part are old boats of the put-put class. In bringing the Ahdeek to Great South Bay, Mr. Schieren introduced one of the highest-class boats which proved to be best suited for local service in those waters. The Ahdeek is a 20-mile-per-hour boat for day work, with cabin protection in case of bad weather or rain. It is essentially a seaworthy outfit, having a high freeboard and a generous flare. The cockpit is large enough to seat ten or twelve people comfortably, and the cabin has two full-length berths, with toilet and galley compartments. The motive power, a six-cylinder, 150-h.p. high-duty Speedway engine, is installed amidships under the steersman's seat. This boat is of the round-bilge displacement type, and offers an interesting comparison with the V-bottom type of the same displacement. A speed of 20½ miles per hour was attained by the Ahdeek, with the dryness and smooth running qualities of the round-bottom boat, which has not yet been obtained in the V-bottom of like displacement and power. The length of the Ahdeek is 38 feet, breadth 8 feet 3 inches, and draught 2 feet 9 inches.



The Spacious Cockpit and Attractive Interior of the Ahdeek, Owned by H. V. Schieren



Aphros

I

My home is on the sea,
Uncharted, vast, alone;
Here Nature calls to me,
In wondrous beauty blown,
Because no hand
Of ladyship on land,
Ere beckons me.

II

So when my ship shall round
The reefs and come to lee,
My heart shall ne'er resound
In joyous melody;
Because no heart,
Save of the deep sea's mart
Ere beats for me.

III

And when my ship shall rest
In harbor's gentle peace,
The lights ashore, at best
Are sad—at least;
Because no eyes
Save those of heaven's dark skies,
Ere welcome me.

—*Dr. C. Darcy Wright.*

Handicapping of Power Boats

By J. Kinzer Shell, Jr.

COMPETITION of power boats in racing along the handicap basis—of which there are several varieties—on the waters of the Delaware River, along the South Jersey Coast and the shores of Barnegat Bay, has been such a success from almost every viewpoint that yachting and power-boat organizations in every section of the country have started a movement to follow up the lead given by the four organizations to further promote the sport and continue its success. At the annual meeting of the American Power Boat Association, the delegates, representing nearly every association or body of yachtsmen throughout the country, were in a dilemma concerning the proper method to follow, in order to stimulate enough interest in the sport of power-boating to keep it before the eyes of the public and draw to it constant attention. It was thought at first, due to the poor showing made last season, that the sport was on the decline and that hardly anything could be done to put it back on its feet.

But it remained for the delegates from the four sections comprising the Delaware River and the two sections of the Jersey Coast to demonstrate to all concerned that the power-boat game was never on its last legs, so to speak, or had lost any part of the foothold obtained in the sporting world. In fact, it was conclusively shown that the sport was actively increasing in interest and that if proper steps were taken by everyone concerned in the sport, there would be no decline either in the sport or in the interest displayed. If everyone will work in harmony this coming season, develop some general and active plan for competition, then the sport will continue to gain in popularity.

Practically the only way which power-boat racing can be put on a solid basis is for the active co-operation of all concerned. This not only applies to the power-boat owner but to the officials of the various organizations and the parent body. It has been realized that at least something must be done in order to keep the sport in the swim, as it were, and if only investigation is made into the forms of racing which have proven a success in different parts of the country, or at least endeavoring to try them out, then the sections which failed to reach the standard of success expected and hoped for by the most enthusiastic of followers, would be willing to listen to co-operation in its every phase.

There are several forms of handicap racing as understood among power-boatists of the Delaware River. The previous performance basis is one form used by the Delaware River Yachtsmen's League. Consistency is another method which has been in vogue for at least eight years along the Delaware River. Racing according to rating between a five-point margin is another method followed. Then there is the interclub racing, the division of classes, the interassociation contest, the altogether form, the deduction of allowances from elapsed time after a race has been completed, and the regular style in vogue since the inception of power-boating in the sporting limelight.

The previous performance basis of handicapping as tried out by the Yachtsmen's League is by no means new in this country, as there are sections in the Middle and Far West which have made more or less success of this plan, but it is the first time that it has been tried out in the East. If the methods as laid down by the committee in charge of racing are followed and a suitable standard set, this plan of competition will further increase the interest in the sport. As worked out by the regatta committee of the Yachtsmen's League, the first race-meet was held under the rules and regulations of the American Power Boat Association. The time of each boat was taken for the distance raced in each class. In the second race-meet the boats entered in each race were given a certain allowance according to the time made in the first race-meet, or over a measured course. A 3% leeway was allowed to each boat participating. If the time limit was exceeded the boat doing so was disqualified. The idea in mind was to get the boats in the various classes competing on equal terms and to bring the boats in each class across the finish line at the same time. Where a boat exceeded its given time, in the next contest, she was handicapped accordingly and the other boats in her class were given that much more or less time to cover the required distance.

But one thing was overlooked and that was tidal conditions, and therefore the plan did not work out as satisfactorily as was anticipated. Of course, the tidal conditions did not affect the result of racing as much as would be expected, but even so, there was the usual kick and protest registered. Then again, men who put their boats in the race on the previous performance basis, turned in an approximate time in which each thought his boat could negotiate the course and invariably missed somewhat in his calculations, overrunning his time, and therefore was compelled to jockey behind the leading boat in order not to beat the given time. But when it came to the next race the owner was right on the job, turned in the proper time, for he became interested in the new plan of competition and was right up with the rest of the boats when the finish line was reached. Of course, not every one of the boats finished together for several reasons, but to explain would be in a way uninteresting. However, a composite idea of the plan can be found in the following summary of one of the many races held, giving the record time, the time allowance with the 3% deducted, the actual running time of the boat, and the time over or below the expected elapsed time of each boat:

PREVIOUS PERFORMANCE RACE-MEET OF THE TRENTON Y. C.,
July 15, 1914

CRUISER CONTEST. Course, 15 Nautical Miles

Boat	Record Time H. M. S.	Time Allowed for run with 3% deducted from Record Time H. M. S.	Time of Race H. M. S.	Overtime H. S.
Elwood Jr.	2:04:40	2:00:36	2:00:37	00:01 slow
Mascot	2:00:18	1:56:41	1:56:43	00:02 slow
Helen T.	2:13:41	2:09:40	1:59:24	10:16 fast

Other boats failed to finish.

GLASS CABIN CRUISER CLASS. Course, 15 Nautical Miles

Hannah II.	2:15:52	2:09:51	2:10:14	00:23 slow
Nymphia	2:10:00	2:06:06	2:10:43	04:37 slow
Edalvi	2:28:30	2:24:03	2:33:14	09:11 slow
Anna I.	2:05:00	2:01:15	2:21:22	20:07 slow

From the summaries of races for cruisers and glass cabin boats it can be seen that the boats did not exceed the given times and the times which were figured by the regatta committee, would, if exceeded, cause disqualification. The reason for deducting 3% from the record time by the regatta committee was to eliminate a great deal of unnecessary work after the race had been concluded. If such had not been done, then the 3% leeway would have to be added to the elapsed time after the finish of a race. This manner of competition proved a decided success, and if those in charge of racing would get down to the actual conditions, endeavor to have each and every boat entered in a race compete according to the performance which she has made in former contests, irrespective of condition, then there would be the chance to see every one of the boats crossing the finish line almost together. Of course, consideration of tidal conditions, the manner in which a boat is loaded down with excess weight in the way of passengers, would go a long way in promoting this plan of racing.

With the completion of each race, the time made by each boat should be taken into consideration and the handicaps or allowances figured accordingly. Thus, if there was engine trouble or otherwise, the skipper could at least endeavor to bring the boat up to its mark. One thing bars the success of such a plan throughout the country and that is the tendency of owners to jockey when in a race. It should be required that the owner testify that the time turned in to the regatta committee in charge of a race at the opening of the season is correct and that it is not over the mark which the boat can accomplish. But even so, the regatta committee can take this into consideration and act accordingly. If a boat exceeds the given time then the boat is disqualified.

Practically upon the same lines as the previous performance basis, and equally as good is the consistency plan of racing. In this form of competition the owner of any style or class of power boat, in fact, a sailboat with auxiliary power can compete, turns into the members of the regatta committee the time in which he thinks his craft can cover the specified distance. The boat which turns in the highest time to cover the course is started off first, according to the difference between her time and the time made by the fastest boat. The boat coming nearest to the given time is declared the winner, provided, of course, that she has not exceeded by 3% her suggested or given time. For instance, from the below summary of the annual Roost Cup Race of the Flat Rock M. B. C., held on the Shawmont Level of the Schuylkill River on July 19, 1916, it can be seen that the winning boat finished in the same time as was turned into the regatta committee:

Order of Finish	Time rated by Owner M. S.	Actual Time M. S.	Difference of Rated and Run Time S.
Junior	67:12	67:12	00
Margaret	70:11	70:21	10
Nancy	26:05	26:27	22
Sylvania	34:21	35:01	40

Classification of boats of the various types according to ratings will do more for the racing game and help along the situation more than what has been done in the past, even though the old style of handicapping must be used with modifications. During the past season on the Delaware River, there were races for boats, especially of the cruiser class, in which a division was made in the ratings with five points as the basis upon which to work and derive the best results. The plan worked out smoothly and it will be found feasible to work this plan of competition not only in short-distance events but in races of over 50 miles. It has always been found in long-distance racing that the boat which had a high rating did not have a chance in the world to come within striking distance of the low-rating boat with the enormous handicap.

At the several races held on the five-point system, the scratch boat in each division had at least some chance to win. While the power-boatmen along the South Jersey Coast have been holding race-meets on this plan since their inception into the racing game, there was never enough leeway in the division of rating to make it prove absolutely satisfactory. But even so, the divisions made were enough to cause the owners to take an active part. The five-point division is about the best which can be obtained. For example, take the interclub cruiser race held the latter part of the season between the Columbia and Riverside Y. Cs., in which several forms of competition were tried out. The boats were started all as one class at the same time and the handicaps were deducted from the elapsed time after the finish of the race. A summary is explanatory.

CRUISERS RATING 30 TO 35. Course, 12½ Nautical Miles

	Rating	Allowance H. S.	El'd Time H. M. S.	Cor. Time H. M. S.
Naomi	30.08	10:28	1:29:25	1:18:57
Doro II	31 07	6:30	1:28:37	1:22:07
Acushla	32.13	3:28	1:26:37	1:23:09
Margaret	32.16	3:08	1:34:50	1:31:42

The interclub cruise is another plan which has been found feasible in the Delaware River Section. It is in a smaller way along the general lines of the interassociation plan of competition. Both styles were tried out with success. The interclub plan gets the yachtsmen more interested in the game, brings them closer together both in social and racing activities, and combines the two very nicely. After the plan has been featured, then the interassociation plan is taken up. Such was the case last season, when the Delaware River Yacht Racing Association held a week of vacation cruise to the South Jersey Coast. The men who participated in it were able by the form of racing to be in constant touch with their fellowshipmates. He, as heretofore, did not have to be out on the briny deep by himself and unable to get in instant communication with another competing boat.

With the boats starting off together, the slower boats were bunched as well as the boats which had excessive speed. After the race, a getting-together of all in the clubhouse was found agreeable and this feeling was strengthened by the addition of the members of the club to which the race had been run. The two bodies seemed to coincide and in this manner there was that general feeling of warmth which means the making of better things. There also proved to be keen rivalry between the representatives of the two associations and even before a race was held, the racing owners talked over what was going to be done in the contest and all worked together for the interest of the sport.

If instead of adhering strictly to the rules and regulations governing racing by the American Power Boat Association, power-boat owners interested in the game would continue to show their interest by following or at least trying out the new styles of competition, racing will not go into the decline which is expected, but it will be in its ascendancy and continue to rise in popularity.

It needs but the co-operation of all concerned and no halfway means in going about the situation, but yachtsmen must work in a wholehearted way, listen to reason and every advocation which is brought up from time to time.

Rudder Designing Competitions

THESE are the dull months for those who love the sea. Only a comparative few are able to enjoy Winter cruising and the large majority are looking forward to the fitting-out time and beyond that to the time when the yachts will go in commission. Many who are enthusiasts devote a large part of the Winter to the study of yachting problems, such as designing, engines, navigation and other matters closely allied to the sport.

A prominent yachtsman recently visited THE RUDDER office and spent much time selecting designs that had been published in the magazine. He said he was particularly interested in model building and had built models of many of the attractive yachts the lines of which had been printed in THE RUDDER. He said he found the study interesting and instructive and also found that it was a money saver because keeping at home evenings necessarily prevented him from spending money foolishly.

There are hundreds of amateurs who are fond of designing. Many of these are just as keen about designing as the best-known professionals. There are many young designers employed in the offices of the big firms who, in the course of their study, work out sets of plans of boats according to their ideas of what a boat should be. For the encouragement of both amateur and professional designers THE RUDDER now announces several competitions for which it offers cash prizes.

Baron Barreto, owner of the yachts Sea King and Sea Queen, is having another yacht built in which he plans to visit Florida waters next Winter and there to enjoy some fishing. He wants a fishing boat which can be carried on the deck of the larger vessel, which will be suitable to use in Florida waters and realizes that the best way to get the designs for this boat is to offer a prize. The boat is to be 25 feet long and he offers ten guineas, which, according to the present rate of exchange, is $50, for the best design. He will select two of the designs submitted, but not necessarily the one winning the $50 prize, and will build.

THE RUDDER will supplement Baron Barreto's offer by adding $25 as a second prize and $10 as a third prize.

This competition will close on March 1st next.

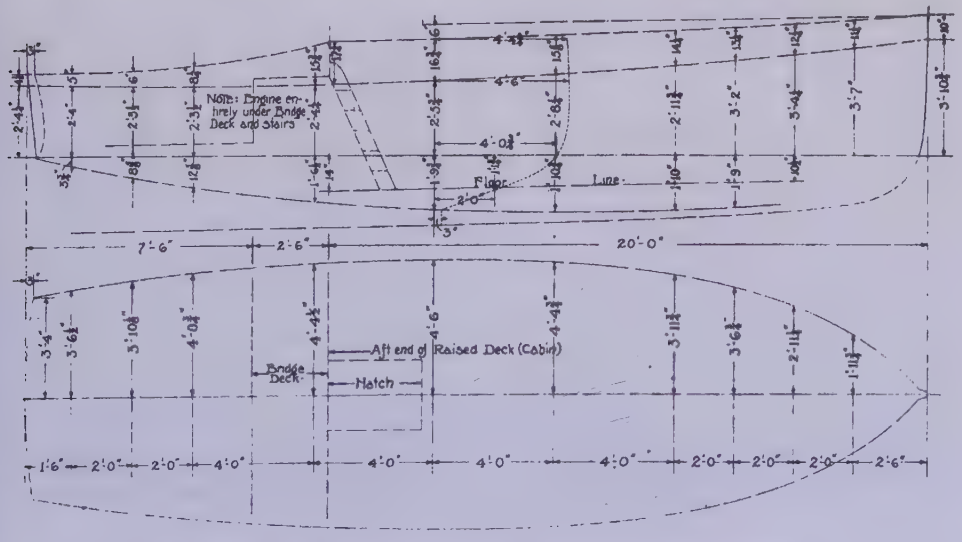
Baron Barreto's letter in which he gives his ideas is as follows:

Prize Competition for the Design of a Yacht's Auxiliary Fishing Boat, suitable for Florida waters.

1.—Length between perpendiculars 25 feet, and an over-all length of 26 feet would be entertained in the case of a counter-sterned boat. The breadth of the boat to be left to the designer as well as the rig. A thoroughly good, dry sea-boat would be preferred rather than a speedy vessel.

2.—The boat to be carvel built and of a suitable design to enable it being lifted by means of a derrick and carried on steel chocks amidships of the yacht.

3.—Provision must be made for the boat to carry a single-cylindered engine weighing 31 cwts. (3,472 lb), length of engine over all from flywheel to tail shaft coupling 5 feet 10 inches, width over all 2 feet 2 inches, height



The Arrangement Plan for the 30-Foot Cruiser Should Be Drawn Within the Outlines Dimensioned

from shaft center to top of cylinder 3 feet 6 inches; revolutions per minute, 400—this will necessitate a large aperture for the propeller.

4.—Any type of rig can be introduced provided the sails are capable of being handled by one man, one person being at the helm, either self-reefing gear, roller boom or no boom and mainsail provided with brails. If a jib is introduced same to have boom and only one sheet to tend itself.

5.—Inside removable ballast or a centerboard or a fixed lead keel can be introduced. Weight of boat with engine on board not to exceed 4½ tons, mast to unship for hoisting purposes and if a mizzen mast is introduced, this also to unship.

6.—No cabin required but a deck or housing round the engine to be provided, a sprayhood or similar protection being provided in connection with accommodation aft.

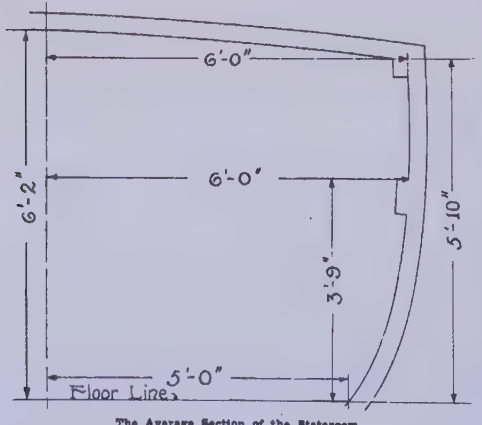
7.—All fittings are to be galvanized iron except fittings underwater, which are to be of brass, it being contemplated that the boat will be copper fastened throughout. A thoroughly high-class boat is required.

The selection of the prize winners will be left to three judges, one a designer, one a yachtsman of experience, and the Editor of THE RUDDER. These judges will be selected shortly and their names announced and they will make their decisions so that the winners may be announced in the April number of THE RUDDER.

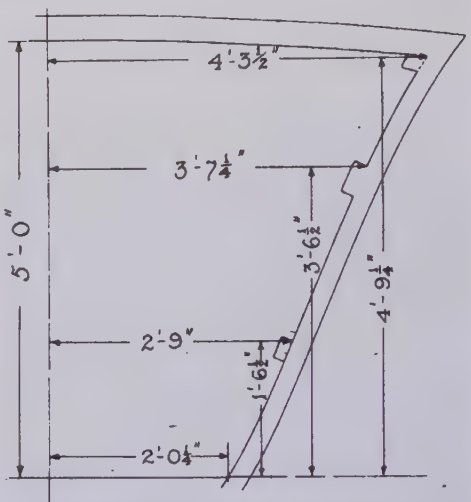
Baron Barreto has evidently in his mind the engine he wishes to install in this fishing boat and he gives its dimensions.

Plans must be drawn to one inch to the foot scale. They must be complete and should also include a table of offsets. In making their selection the judges will also take into consideration the completeness of the plans and the neatness with which they have been drawn.

Competitors should mark their plans with some nom de plume or insignia, but should not put their real names on the drawings. A letter should accompany each set of plans which should contain the nom de plume or insignia and give the real name and address of the designer. This letter should be placed in a sealed envelope which will not be opened until after the judges have selected the designs which in their opinion are entitled to the prizes.



The Average Section of the Stateroom



The Average Section for the Galley. It Is 5 Feet Long and Extends to the Center Line of the Boat

Supplementary to this competition THE RUDDER offers three prizes for the designs of a 40-foot shoal-draught work boat, one prize for the best interior arrangement for a 30-foot power cruiser, one prize for the best arranged stateroom and one prize for the best arranged galley.

40-Foot Shoal-Draught Power Cargo Boat

There is a demand for small shoal-draught cargo boats. Comparatively few are built and of those many could be improved with a little study. For the development of boats of this type THE RUDDER offers $65 in prizes, divided as follows: First prize, $35; second prize, $20; third prize, $10. The conditions are brief:

A shoal-draught power cargo boat; length over all not to exceed 40 feet; breadth, no restrictions nor limitations; draught, not to exceed 30 inches. The boat to be driven by a heavy-duty engine of from 15 to 25 h.p. It is to have sleeping accommodations for two and a galley of sufficient size to supply the needs of the two. The cruising radius should be 300 miles.

All drawings to be to a scale of not less than ¼ of one inch to the foot. The dimensions and particulars to be lettered on the drawings. Each drawing to be marked with a nom de plume or insignia and the name and address of the designer, together with this nom de plume or insignia to be in a sealed envelope.

This boat is intended for trading in Southern waters. Care should be taken to make the lettering large enough so that it can be read when reduced and reproduced in THE RUDDER.

This competition will close on April 2d, as April 1st comes on Sunday. The judges will be announced later and their decisions will be published in the May number of THE RUDDER.

30-Foot Interior Arrangement Plan

Here is a competition that does not require nearly as much study as the two former, but will call forth the ingenuity of the contestants. THE RUDDER offers a prize of $15 for the best arranged interior of a hull 30 feet long, and a prize of $5 to the second best. The hull has a plumb stem and a transom stern. The boat is of the raised deck type, the cabin being 20 feet long, and under this the designer must arrange to comfortably accommodate three persons. The engine is under a bridge deck and the tanks are aft so that there is absolutely 20 feet of space for the owner's accommodations. The scheme of ventilation will also be considered in awarding the prize.

This competition will close on April 2d, and the conditions governing the shoal-draught power cargo boat will govern.

Best Arranged Stateroom

Here is a competition in which women should have fair chances of success. One so often hears a fair visitor to his yacht say, "Oh, if a woman had only arranged this stateroom or this galley how different and better it would be."

Women are invited to show that they can do as well as the men and it may be that some new wrinkles in interior arrangement may be learned.

THE RUDDER offers $10 for the best arranged stateroom. This room is 10 feet long, 6 feet wide, half the full width of the yacht, 6 feet 2 inches headroom and has 50 square feet of floor space. The outline plans printed herewith give the general dimensions and it is to be fitted and furnished. This room is on a raised deck cruiser. It has a skylight in the deck and three ports on the outer side.

Best Arranged Galley

THE RUDDER also offers $10 as a prize for the best arranged galley. This galley is 5 feet long and has about 10 square feet of floor space. The outline plan gives its general dimensions. In judging this competition consideration will be given to the simpleness of the arrangement and everything used in the galley should be so arranged that the cook does not have to jump from one side to another to find the different cooking utensils or foods. The galley must be equipped with stove, sink, dish-rack, lockers, assuming that the ice-box is elsewhere.

The galley competition will also close on April 2d, and the conditions governing it are the same as those governing the cargo boat contest.

To further stimulate interest in these competitions, everyone who in good faith furnishes a plan or set of plans, but who is not successful in winning a prize will receive one year's subscription to THE RUDDER. The plans must be drawn in black india ink and to a scale of not less than ¼ inch to the foot except in the fishing boat contest, which is one inch to the foot.

Why the Power-Boat Club—and What

By Charles A. Starr

CO-OPERATION—the community spirit—the help-one-another idea, will find no freer expression about New York City than in the power-boat clubs which line the rivers and bays. Be it the loaning of a tool or lending a hand at some job which requires more than the number of hands allotted to an individual, there is a plethora of assistance tendered. This, in spite of the fact that probably every boatman has a list of tools loaned and never returned—or returned broken—and is able to recall that so-and-so is always on the borrow and never has anything to lend.

Power-boat clubs in the majority of cases have blossomed forth from a boathouse, an expression of the desire of a small group of "bugs" for an atmosphere different from the commercialism of the boathouse, though it may have a club license. The owner runs it for dollars and he gets his toll from all, and often there is a booziness about the place which repels the self-respecting. Out from these places the nucleus of the clubs of today have come, with a few exceptions.

Some of the clubs are the legitimate successors of the yacht clubs. Back in the days of windjammers there were clubs on all the waters where there was sailing space but these were quite different affairs from the power-boat clubs of today. Most of these yacht clubs, which still are in existence today, have more power craft than sailing; a few which have abandoned spars entirely still bear the name yacht in the title, memoir of past days.

Power-boat clubs did not come into existence rapidly. In the days of the development of the craft and engines, it was necessary to be handy to an expert, for the cranky things had more moods than an old-time auto, and constant tinkering was needed to keep going. Now that engines need only to be supplied with the requisite gas and oil and batteries, be kept clean and dry, and they will run almost automatically, the boathouse mechanic is not so necessary. Besides, the "bugs" are learning about engines and magnetoes and storage batteries and need little advice, and that they get from their favorite boat publication and their friends. If they require a job calling for a skilled workman, the engine goes to the factory or some mechanic member of the club finds time to do it.

Saturday and Sunday at the clubs is like old-home week in the country village, and the realistic effect is made more perfect when the members begin to borrow—what is home without a neighbor to borrow from? Torch and wheel puller and giant Stillson change hands, and someone else wants a ⅜ drill or a pipe die, and from somebody's locker they come. One has but to rub his hands and wish and Aladdin-like the object appears. The little dab of color, or putty, the two screws, the bit of shellac are somewhere in the lockers. Push the button and some member will do the rest. They help put on one another's covers and if there is an engine to be lifted from a boat, the club's rigging is manned by enough to

lift twice the weight. What a chance a Boy Scout would have to do his one good turn a day at one of these clubs!

Do you know, I think this spirit of helpfulness is about all that keeps some of the clubs alive. There is a bar, of course, which is patronized by many occasionally and by a few often, and there are club dances and entertainments which call the younger members together with their coteries of non-members, an occasional beefsteak party or a smoker, but it is a fact that these do not attract the larger number of members. What was the strong feature of the yacht clubs has no lure for the power-boat "bug".

There is a reason. It took good red blood and some skill in sailing to make a yachtsman; still, at the best, it was a lazy pastime. The true power-boat "bug" demands surety of arriving at destination and getting back home again. He wants to keep moving. The new spirit has taken the yachtsman, also, for the major part of pleasure sailing craft today has in the hull a little "kicker" which will bring home the party when the wind fails.

The power-boat "bug" is of a different type. He does not care for white ducks. If he does he is not a true "bug". Overalls and jumper, of the khaki variety, preferably, seems to be his ideal of uniform, except at the rare inspection, going into commission day, or when there is a "big time" at the club. He doffs the street clothes in the locker or cabin on reaching the club and they do not appear until the return from the week-end trip. It is his idea of rest to start away in grimy khaki—what could white ducks do when the engine balks? Perhaps it is a relic of the days when the engine could be expected to go wrong every trip, but though he may not have to look at the engine all day, he is prepared for the emergency, should it come.

It is to be wondered at that none of the distinctly power-boat clubs have carried the co-operative idea to its logical conclusion. Some of them, like the Shattemuc, at Ossining, buy gas for the members at cost—and sell it to others at the market price; the New York Motor Boat Club buys oil and grease for the fleet, and all have marine railways and haul out boats and store them at cheap rates. But why would not the plan of the Automobile Club of America work at any one of the larger power-boat clubs? Why would not the co-operative purchase of all supplies be of great advantage to club members, and why would not a workshop, where members could overhaul engines, be popular?

Most of the clubs have some sort of a makeshift workshop. At the New York Motor Boat Club an open shed has a bench with a couple of vises and a pipe vise. If it were several times as large and enclosed, with a bench running around the walls, and skids on rollers for engines were provided and lockers for tools built in under the benches, there would be some convenience and members would be willing to pay a slight fee for their use. This is the idea of one of the older members, once captain of a two-sticker.

Twenty-five members of the same club bought covers this Fall. What competition there would be for this if the club should ask bids for the lot! Probably most of the boat owners bought a package of nails this Fall and will buy more in the Spring. It will figure up several hundred pounds in the aggregate, along with what the club uses in repairs. Dry batteries—and means of re-charging storage batteries for those who have not generators—paint, rope and the thousand and one articles needed by members could be provided at much lower rates than are charged individuals.

If the new plan to bunch several of the power-boat clubs between 143d and 155th Streets goes through, a move will be made to provide a co-operative shop and supply house for all the clubs located there, several of the members have told me, so that it will not be necessary for a "bug" when hurrying to go into commission to wash up and change clothes and climb a hill and walk several blocks to buy a lag-screw or two, or six inches of pipe.

One of the helpful things to be done in several clubs the coming Winter is to have lectures which explain the rules of the road, lights, aids to navigation, charts and compass and other things a power-boat man should know. These are under the auspices of the U. S. Power Squadrons, but are open to all interested. Other helpful lectures are planned.

Ice-Yachting

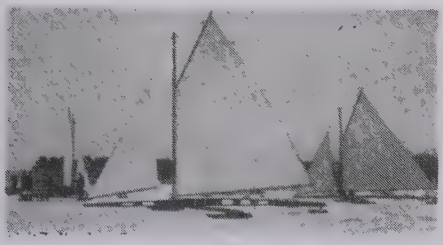
By H. Percy Ashley

THE leading ice-yachting event of last year was the meet of the North Western Ice Yacht Association at Menominee, Mich. Oshkosh and Milwaukee were represented by Debutante III, 600 square feet, and Debutante I, 300 square feet (the latter boat being the duplicate of W. Butler Duncan's Whirlwind, of Manhasset Bay). Both these boats were winners in their respective classes of the meet at Madison, Wis., on January, 1915, and were built by Buckhout, of Poughkeepsie, N. Y., and owned by Douglass Van Dyke, of Milwaukee. The Mercury was sent from Oshkosh by John Buckstaff. Madison was not represented, owing to the death of Emil Fauerbach, the leading ice-yachtsman of the Middle West. The Menominee Club entered the Square People, 600 square feet, owned by Clarence Peterson, and Old Craft, 600 square feet, formerly the late Commodore Higginson's Aurora, of Orange Lake Club, N. Y., both designed by Ashley. These were in Class A.

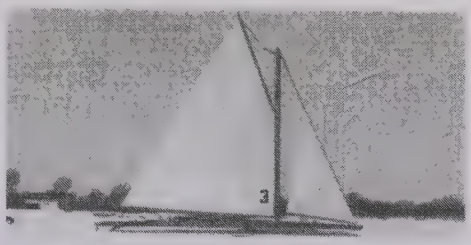
In Class B, Milwaukee had Icicle, owned by Lotha Smith, with several competitors from other clubs.

Three races were sailed. The first race was in a light wind. It was won by Square People in considerably under the time limit of one hour for 18 miles. No other ice-yacht finished. Square People won the second race by a good margin, with Debutante III about 4 minutes behind. Old Craft was last.

The third race was not finished, owing to lack of wind, but Square People was a lap ahead of Debutante III at the point where the boats died. That night down came two feet of snow and there was no more racing for the rest of the season, so by the rules of the Association there was no meet. It requires three races inside of time



One of the Crack Eastern Boats



Debutante III

limit to make a meet of the North Western Ice Yacht Association, and no silverware was distributed. All the cups are resting peacefully in the Association's treasure vault awaiting this Winter's meet at Oshkosh, Wis.

In Class B, Mercury won one race; no others finished. Debutante was sailed by John Buckstaff, Square People by Peterson and Wall, Old Craft by Hines and Matson; Mercury was also sailed by Buckstaff. In the North Western Association yachts are divided into three classes, determined by the maximum of their sail area limit. All ice-yachts to and under 625 square feet of sail are eligible to Class A; to and under 450 square feet to Class B, and those to and under 250 square feet to Class C.

The present types of racing ice-yachts have resolved themselves into two distinct styles—the Madison and Hudson River type, which are both sloop-rigged. The Madison type have trussed-up runner plank, side bars, and an aft rake to the mast with an abnormally large jib. These boats can be built very lightly, notwithstanding their solid backbones, which are smaller in sectional area than those of the Hudson River type. A fault in the Madison type is that the forward end of the backbone lifts, owing to its light construction, which results in slacking of jibstay and consequently additional slacking of leech of mainsail. The trussed-up runner plank is stiff, resulting in the shaking of wind out of the sails when running over rough ice in a light breeze. The advantage of this type is in its quickness in stays, owing to shorter length of hull and the proportion of sail area to length, this proportion being larger than in any other type. Also in heavy winds they allow men on the runner plank whose weight is of great benefit.

The Hudson River type of the 250 and 350 square-foot class also receive this additional benefit by the addition of flat lead weights at the outer end of the runner plank, fastened by straps and graded in sizes to suit the strength of the breeze.

The Madison type was tried and discarded years ago by the ice-yachtsmen on the Shrewsbury, N. J. William Banard, of Madison, took up this style of ice-craft and developed it. He was ably backed by the late Emil Fauerbach, who had built by Banard Princess I, II and III. With the latest boat of this type he cleaned up everything in the Middle West except the big Wolverine, and if I remember correctly, they never met on the ice. With its advent, the Western enthusiasts commenced to cry down the Hudson River type without side bars, and said they had upset all the theory written in THE RUDDER in favor of this type of boat. The latter were too heavy and could not win races. The true fact of the matter was that they had never seen an up-to-date Hudson River ice-yacht. At the North Western Ice Yacht Association Meet in January, 1914, at Oshkosh, Princess II, with 425 square feet, won in Class A against several boats carrying from 600 to 625 square feet. Princess was right up-to-date in her Madison type while the balance of Class A were of Hudson River designs of ten years earlier. George Buckhout, of Poughkeepsie, in consequence, received an order from Douglass Van Dyke, of Milwaukee, for three boats, as follows: Debutante I, 300



Scud, Owned by Commodore James B. Weaver. The Only First Class A Ice-Yacht in the East



Taxie, Dr. Stanbrough's Cat

square feet; Debutante II, 250 square feet; this boat has cockpit halfway between runner plank and heel of backbone; and Debutante III, 624 square feet. The two former boats are fine, up-to-date productions, but Debutante III is by long odds the most expensive ice-yacht ever built, and is the finest example of the Hudson River type ever constructed. Extreme lightness was obtained by using stronger and lighter material than had ever been used before. The runners, runner chocks and mainsheet winch are of nickel aluminum, turnbuckles and other fittings forged Monel metal. The spars are hollow and are shaped to reduce wind resistance, as suggested by recent aeroplane struts. The backbone is hollow but unusually light, consequently of a greater cross-section area than usual. The runners are formed of two pieces of nickel aluminum about 1⅛ inch thick; between them is inserted a ¼-inch thick saw blade which protrudes slightly below the runner and is ground to a knife edge, which are very fast, especially on soft snow ice. This boat was entered as well as the other two Debutantes in the North Western Association Meet of January 19, 1915. Debutante III won in Class A, Class B Debutante II got second place and first place in Class C. Debutante III also won free-for-all race for Peterson Cup. So you see there is no kick coming on the Hudson River type.

This racing of the various types will give data for the ice-craft of the future which will embody the advantages of both styles of the East and West and superior additions of construction either by accident or design. The discarding of the side bars on the Hudson came about years ago by Herman Relyea breaking his side bar and replacing it by twisted telegraph wire, which led to the building of the Robert Scott by him in 1879. That was the first ice-boat to appear with wire side guides, and beat boats double her size with ease. The lateen type has practically gone out of existence, as the trouble seems to be to keep a tight leech.

I think there is a great future in cat-rigs, say of 250 square feet. The largest cat ever built was years ago by the late Commodore H. C. Higginson, of Orange Lake. This boat was called Shadow, and carried 800 square feet of sail. She was badly beaten at races on the Hudson and was dismantled shortly after being built. If this boat had not been so heavily constructed she would have given a different account of herself. The trouble with cat-rigged boats is that in some breezes they will act beautifully and in other winds become uncontrollable and dangerous, especially in a bunch rounding a stake. This can be overcome by building a series of small boats, finding out and correcting their faults, as has been done by the larger craft of sloop-rig.

All new ice-yachts are now built to class as originated by THE RUDDER years ago. Orange Lake, N. Y., has her 250 square foot class; Red Bank and Long Branch, N. J., 350 square foot class; the boys' club of Red Bank, 150 square foot class; Manhasset Bay, L. I., 300 square foot class; Kalamazoo, Mich., 450 square foot class; North Western Ice Yacht Racing Association, 625 square foot class. So you see that class racing has become a feature East and West.

Time allowance for mixed classes made so many disputes under various conditions that it has passed into disuse to a great extent. It would be a good thing for the sport if the experienced racing ice-yachtsmen would combine and make a cast-iron rule to cover thoroughly, without any loopholes, the situation when an ice-boat goes dead in a petering-out breeze. How long can she be pushed? As the rule is now a man could push over the whole course, providing he had the strength and could make it in the time limit, and would win the race. This rule is urgent and no one knows the correct interpretation while racing at the present time.

A new ice-yacht, yet untried, has been built by William Gardner, the yacht designer. She is a Class C boat, carrying about 450 square feet, with one of the finest hollow backbones I ever had the pleasure of examining, built by the Pigeon Fraser Hollow Spar Company from Mr. Gardner's designs. This backbone carries two cockpits, made by Wood, of City Island; the forward one to be used by the sheet tender. The runners and plank of this boat came from the noted Cold Wave, owned by the late Commodore Higginson. This boat will give a good account of herself, but will have to be a scratch boat at Manhasset Bay, as all the other craft are 300-footers.

Outlook in New England for 1917

By Hollis Burgess

THE New England yachting season of 1917 will unquestionably break all previous records for activity and more persons will be interested in the greatest of all sports—yachting—this coming season than ever before. The New England boatyards are all humming with work and the art of boatbuilding in Massachusetts, Maine, Connecticut, New Hampshire and Rhode Island is coming into its own again. Last year showed a marked increase in the number of new yachts constructed over previous years, and this year will unquestionably show a still larger increase.

Massachusetts and Maine are the two most active boatbuilding States in the whole country. In Maine, especially, families of boatbuilders have been turning out boats both for business and pleasure purposes for generations. There are probably more boatyards in Maine than in any other place.

In Boston, so often affectionately called The Hub of the Universe, the yacht designers and builders are hard at work. The well-known firm of Swasey, Raymond & Page are rushed with orders, some of which are:

A 56-foot power cruiser for W. S. Miline, of Chattanooga, similar to the type of the Quicksilver, flagship of the New Orleans Y. C.; 63-foot scout cruiser with a 600-h.p. Sterling engine, for James Laughlin, 3d, of Pittsburgh; 67-foot express cruiser for Jacob C. Benz, of Nahant, Mass.; 46-foot scout cruiser for C. Earle Arnold, of Portland, Me.; 53-foot express cruiser with a 300-h.p. engine to develop a speed of 28 m.p.h.; 37-foot auxiliary sloop for W. M. Lovering, of Taunton, Mass.

Also the following orders for—

Joshua Crane, Boston, 53 feet o. a. by 11 feet breadth; 300-h.p. Duesenberg; patrol boat.

Silas Adams, Portland, Me., 46 feet o. a. by 9 feet 6 inches breadth; eight-cylinder Van Blerck; patrol boat.

U. S. Government Coast Guard boat, 68 feet o. a. by 14 feet breadth; two eight-cylinder Van Blercks; patrol boat.



The Camden Yacht Club's House at Camden, Me.



Boothbay Harbor Yacht Club, Boothbay, Me.

John Price Wetherell, Philadelphia, 55 feet o. a. by 11 feet 6 inches breadth; two eight-cylinder Sterlings; patrol boat.

Ralph Emery, Boston, 76 feet 10 inches o. a. by 14 feet breadth; 300-h.p. Sterling; patrol boat.

Bernhard Zahn, New York, 46 feet o. a. by 9 feet 3 inches breadth; 200-h.p. engine; patrol boat.

Wm. Laidlaw, New York, 74 feet o. a. by 12 feet 6 inches breadth; six-cylinder, 100-h.p. Sterling.

Boat, 56 feet o. a. by 12 feet 6 inches breadth; two four-cylinder Sterling engines.

Samuel Croft Davis, St. Louis, 72 feet o. a. by 13 feet breadth; two six-cylinder, 400-h.p. engines.

Mr. Oburd, 17-foot catboat.

Steel yacht, 110 feet o. a. by 16 feet breadth by 4 feet 6 inches draught; two 200-h.p. Winton engines.

Wooden yacht, 120 feet o. a. by 20 feet breadth by 8 feet draught: 200-h.p. Wolverine engine.

Steel boat, 140 feet o. a. by 16 feet breadth by 5 feet draught; 1,000-h.p. gas engine.

Richard Benedict Van Horne, Montreal, Canada, auxiliary ketch, 78 feet o. a. by 16 feet breadth by 9 feet draught; 50-h.p. Sterling engine.

Elliot N. Burwell, who has recently entered the yacht-designing field on his own account, has the following orders, which he is working on:

A 54-foot l. w. l. cruiser for Robert Cushman, New York, 11 feet 7 inches breadth, 5 feet draught, to carry 60-h.p. oil engine; 40-foot high-speed cruiser for use on Lakes Erie and Ontario, 7 feet 10 inches breadth, 3 feet draught, to carry two 120-h.p. engines, for W. M. Matthews, the graphite king of the Canadian Northwest; 55-foot very fast express type cruiser for H. Banfeld, of Minnesota, for use on Lakes Huron, Superior and Michigan; 60 feet 8 inches by 12 feet by 3 feet 6 inches draught, submarine chaser of the true wave-collecting type, for a Western New York yachtsman. This boat will be unique in that she will carry a torpedo tube and a 3-pounder forward. Six 22 feet by 5 feet livery launches for C. Burtwell, of Boston and Alton, N. H., to be equipped with small two-cycle engines of 8-h.p. each, and to make a speed of 10 m.p.h.; 35 feet by 34 feet 10 inches by 6 feet 1 inch by 2 feet 3 inches family runabout for Allan B. Forbes, of Manchester and Lake Winnipesaukee, N. H., to carry a 20-h.p. Wisconsin engine, speed 14 m.p.h., to be used for fishing, general camp work, etc.; 28-foot fast runabout on the "E.N.B. Special" Lake Winnipesaukee lines, 5 feet by 28 feet by 2 feet 3 inches draught, to carry a high-speed automobile engine of very light weight that will give a speed of 28 m.p.h., for J. Hessler, of Massachusetts; 50 feet by 7 feet by 3 feet fast afternoon runabout for E. B. Edwardes, to carry two high-speed Wisconsin engines, which will give the boat a speed of 30 miles. This boat is similar to Vedette, the 47-foot launch designed by Burwell for Reginald Foster, of Boston, and which has turned out to be a very fast boat. Two 200 feet by 32 feet 6 inches by 5 feet refrigerator steamers for South American interests, to be propelled by Diesel twin-screw engines; one 230 feet by 41 feet by 21 feet draught steel schooner to carry general cargo from the United States to Japan and China; 55 feet by 11 feet 6 inches by 5 feet draught cruising launch for a Boston Y. C. man, to be propelled by a heavy-duty engine, in all probability a Sterling; 37 feet 6 inches by 8 feet by 3 feet draught coast cruiser, 40-h.p. engine, estimated speed 12 m.p.h.

He has also completed a cabin and sail plan of a Class E, 55-rater keel schooner for F. W. Oliver, of Bradford, Mass. This boat scales over all, 89 feet 6 inches, 58 feet l. w. l., 17 feet 6 inches breadth and 11 feet draught, lead keel of 25 tons. Accommodations are for five guests and owner, six men forward.

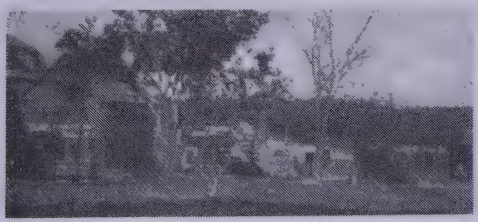
William J. Deed, Jr., is working night and day on the following orders:

A 75-foot, 30-mile cruiser for a prominent Boston Y. C. member; 54-foot cruiser for C. W. Clifford, Jr., of Bath, Me., who built a 64-footer from Deed's design last Spring; 50-foot, 22-miler for a friend of Mr. Clifford's; 41-foot cruiser for Commodore Donahue, of the Savin Hill Y. C.; 41-foot cruiser for E. C. Lang; 38-foot cruiser for C. W. Hull; 30-foot cruiser for New York owner; 36-foot cruiser for a Canadian Government official in Ottawa; 45-foot cruiser for Frank Matthews, Seattle; 48-foot cruiser for F. M. Gibbs, of San Francisco; 80-foot trading vessel for a Manila trading company; 50-foot service boat for an oil company in Mexico; 50-foot cruiser for leading Eastern Y. C. member, of Marblehead; 47-foot cruiser for J. A. Davis, of Amesbury, Mass., and a four-masted schooner for South American trade.

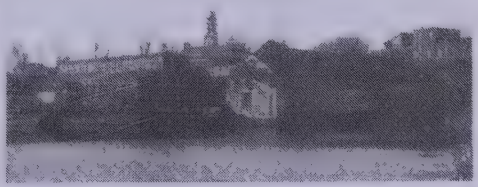
In addition to handling the designing for two wood boatbuilding yards and one steel boatbuilder in this country, he has also been selected to handle and design several boats for AB Stockholms Motorbatsvary, the largest power-boat builders in Sweden, and by a Danish gentleman to design a 110-foot schooner for a trip around the world.

John G. Alden has the following orders:

An 81-foot power yacht with two 175-h.p. engines for a Boston yachtsman, building at Wiscasset, Me., by F. F. Pendleton; 40 feet by 12 feet cruising power boat for a New York yachtsman; Class R racing knockabout, building at W. B. Calderwood's yard, Manchester, Mass., for Chas. E. Adams, of Boston; Class R racing knockabout, building at W. B. Calderwood's yard,



Shops of the Cape Cod Power Dory Company at Wareham, Mass.



The Plant of the Camden Anchor-Rockland Machine Co., at Camden, Me.



The Narragansett Bay Yacht Yard, Sabins Point, Riverside, R. I.

Manchester, Mass., for Samuel Dauchy, of Chicago, Ill.; 37-foot water-line, flush deck yawl for Allen T. Weeks, of New Bedford, Mass., and a class of sailing tenders for Sakonnet Point, R. I.

George Owen, when not busy with his duties as Assistant Professor of Naval Architecture at the Massachusetts Institute of Technology, is hard at work on several new designs, and B. B. Crowninshield and Arthur Binney have considerable work on their boards.

At Neponset, a Boston suburb, the well-known boatbuilding firm of George Lawley & Sons are rushed with work, as usual. Among a large number of orders are:

A 72-foot and a 70-foot power yacht for New York yachtsmen; 50-foot express cruiser for E. C. Crossett, of Davenport, Ia.; 55-foot scout cruiser for H. B. Endicott, of Dedham, Mass.; 92-foot express cruiser for Frank Flynn, of New York, and several scout cruisers.

Murray & Tregurtha Company, of South Boston, are turning out a large number of their sea sleds, which develop a speed of about 40 miles an hour, and have several other orders on hand.

The Toppan Boat Company, of Boston and Medford, Mass., are very busy. They have lately finished twelve 21 by 6-foot Mower-design sailing dories for New York yachtsmen. One of these little craft has been shipped to Dr. J. A. Hodgson, of Waukesha, Wis., to be used at Jupiter, Fla.; also one to C. N. Pitnam, to be used at Sarasota, Fla. They are also busy on their new Duck Class, which really is a wonderful proposition, and is 12 feet long, selling at $50. This is made with centerboard and equipped with leg-o'-mutton sail, and on account of the breadth, is safe, and certainly a great thing to get over the ground for duck shooting. This is something entirely new and this company, on account of the speed, are selling a number to boys, and it will only be a question of time when they will sell many more. The 21 by 9-foot and 24 by 10½-foot auxiliary Cape catboats are also being built to order, and also the regular Toppan fishing dories are in demand as well as the higher-priced dory launches. The Toppan 15-foot detachable rowboats are very fine ones for use with engines, and dozens of these are in the different processes of construction.

The Toppan raised deck cruisers in 27 and 30-foot sizes are also being ordered by several people and are of the same fine construction as in previous years, with many new improvements.

At Marblehead, Samuel H. Brown, Jr., the promising young naval architect, has a surprising amount of work on hand, which includes:

A 50-foot V-bottom express cruiser for Lawrence F. Percival, Esq., building by James E. Graves, the well-known Marblehead builder; designs of 80-foot patrol cruiser for prominent Boston yachtsman; 17-foot sailboat for A. P. Homer, building by Brown Brothers; 19-foot ferryboat for L. F. Percival, building by Brown Brothers; several other orders which include 22-foot V-bottom runabout, 30-foot V-bottom runabout, 40-foot V-bottom cruiser, and 40-foot round-bottom cruiser.

Stearns & McKay Company are turning out several of their 25-foot fast cabin cruisers, which are extremely attractive craft and very popular among New England yachtsmen.

Britt Brothers, of West Lynn, have their shops filled with work to their utmost capacity, to far into next Summer, and have turned away several orders on account of inability to build the boats in time for next season.

At Amesbury, Mass.; the well-known Atlantic Boat Company are turning out their usual number of boats, one of their specialties being a stock 30-foot fast day cruiser, with a speed of 18 miles an hour.

At Osterville, Cape Cod, the home of the famous Crosby Brothers, more work is in progress than ever



W. B. Calderwood's Yacht Yard at Manchester, Mass.

before. H. Manley and Wilton Crosby have the following orders:

A 23-foot auxiliary cat for E. C. Cornwell, of Oak Bluffs; 30-foot runabout launch for Horace S. Sears, of Cotuit; five Wianno 17-foot class one-design knockabouts for South Yarmouth yachtsmen, and two of these boats for Wianno yachtsmen; also a 15-foot water-line knockabout for Andrew Adie, of Wianno, and a 28-foot cat for an Edgartown yachtsman.

Charles H. Crosby is building an 18-foot water-line catboat for James M. Brown, of New York, and has other work on hand, while Daniel Crosby & Son are working night and day.

William H. Hand, Jr., of New Bedford, Mass., originator of the V-bottom boat, has the following list of orders: A 25, 30, 32, 55, 85, 90 and 106-footer, also three 40 and three 60-footers.

The Cape Cod Power Dory Company, of Wareham, are turning out a large number of stock boats, especially their 21-foot runabouts with 12-h.p. engines.

In Rhode Island, the Herreshoff Manufacturing Company are turning out the usual quota of high-grade yachts, which have made the name of Herreshoff so famous throughout the world.

At East Greenwich, Frederick S. Nock has several orders for power yachts for New York yachtsmen. The Narragansett Bay Yacht Yard at Riverside have the following orders:

Raised deck keel cruising schooner, 40 feet o. a., 28 feet w. l., 8 feet 6 inches breadth, 5 feet 3 inches draught, sail area 850 square feet, 6 feet headroom, for Charles H. Weeden, of Providence; 27-foot auxiliary yawl for J. D. Lory, and a 55-foot V-bottom power boat for B. W. Smith.

In and near Boothbay Harbor, Me., boatyards are very numerous, and the boom in yacht-building has struck here with a vengeance. Irving W. Reed, whose boat-building plant is situated at the head of Boothbay Harbor, is building for the New London Ship & Engine Company a 122-foot passenger boat to be equipped with a 250-h.p. Diesel engine; also a 66-foot water-line auxiliary schooner for Roland C. Nickerson, of Boston, and a 36-foot power cruiser for Allen O. Gould, of Portland, Me. He also has a large amount of other work on hand. At East Boothbay, Rice Brothers are turning out hundreds of their famous stock runabouts, while Hodgdon Brothers and The Adams Shipbuilding Company have their usual amount of work.

Farther East, at the beautiful port of Camden, the Camden Anchor-Rockland Machine Company are building for delivery in 1917, four 38-foot lifeboats for the U. S. Coast Guard, to be fitted with four-cylinder Model "F" Sterling engines; a 28-foot day cruiser, power, 20-24-h.p. Standard engine, for Mr. Chas. Ringling, to be shipped to Tampa, Fla.; and a 30-foot express cruiser for Preston Player, Boston, Mass., power, 20-35-h.p. Sterling engine. They also expect to close a contract in the near future for a 120-foot oil-burning yacht from designs of Swasey, Raymond & Page, and an 88-foot auxiliary schooner yacht.

Condon, at Brewer, F. F. Pendleton, at Wiscasset, Chas. F. Brown, at Pulpit Harbor, The Ledgemere Company at Five Islands, Hayes, at Bar Harbor, Davidson, at Portland, Morse, at Friendship, are hard at work.

People are beginning to realize that there is more real pleasure and health to be found on the sea than anywhere else, and the boatbuilder, after many comparatively dull years, is finally reaping some of the golden harvest which has fallen to the United States as a result of the Great European War. Automobiles, which many people predicted would hurt yachting, have proved a blessing rather than an injury, as many a person owns a yacht which he could not use if he did not have an automobile to reach it with.

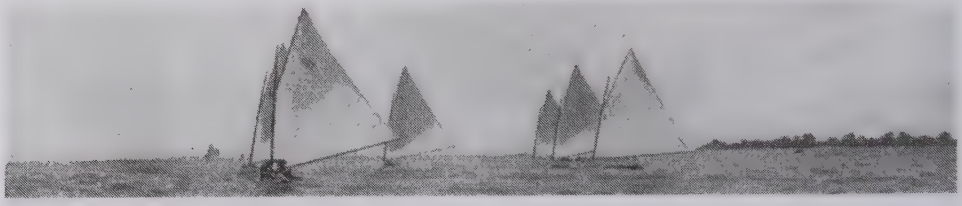
Another powerful factor in the boatbuilding boom is the United States Navy, which is developing an auxiliary patrol squadron of fast power yachts, and inducing yacht owners to build boats especially for a Naval Coast Defense Reserve.

With the boom in yacht-building also comes an increased demand for second-hand craft, and all along the coast the gasolene engine manufacturers, the sail-making shops and all the other boat accessory dealers are busy.

Although there will be no America Cup Race in 1917, yacht racing generally has a very promising outlook. The keenest racing on Massachusetts Bay will be in Classes P and R, and in several new one-design classes, particularly the new Quincy Y. C. and Annisquam Y. C. classes, for which many boats are being built.



Ledgemere Company's Boatbuilding Shop at Five Islands, Me.



Speeding Up a Racing Cape Catboat

By Erland D. Debes

THE Cape Catboat Association of the Quincy Y. C., Quincy, Mass., has for a number of years furnished one of the most spectacular classes of Massachusetts Bay, and the past season has been one of the most successful in its history, seven boats racing very consistently and keenly throughout the season. The showing made by Dr. H. A. Jones's 26-year old Hanley-built cat Almira is remarkable and the reasons for the surprising speed shown by the boat this season, I believe, are of interest to all yachtsmen.

The Almira was bought by Dr. Jones three years ago, and was then in rather a run-down condition, as she had been sold out of the Cape Catboat Association as hopeless, and had not been raced for two or three years. Dr. Jones, however, had great faith in this splendid boat which C. C. Hanley, who probably has built more first-class catboats than any other man, considers the best he ever turned out. The first jobs on the Almira consisted in burning off about seven or eight coats of paint and generally cleaning out and repairing. The ballast consisted of iron and stone; lead was substituted for the stone and the ballast arranged in the orthodox manner used on catboats, viz.: spread out over the floor and even out in the wings. The boat made a poor showing that season, partly due to the mainsail, which did not have the proper amount of draught, and partly due to the fact that the boat was poorly balanced, carrying very much weather helm. Next year, season 1915, the showing was better, as a new sail by Hamlin, Boston, was used. This sail has been in service constantly for two seasons without being touched by a sailmaker, and is still a perfect setting sail, with a good draught and flat leech, as may be seen from the photo. A barndoor rudder had been substituted for the old rudder under the stern, which improved the balance so that, closehauled, the rudder is practically midships; in fact, in light air the boat will go to windward for minutes without the wheel being touched. During that season all the iron ballast was removed and only lead used, arranged on both sides of the centerboard boxes as low down as possible. Although the Almira would show remarkable burst of speed at times, improvements had to be made to land her at the head of the class, and during the Fall and Winter 1915-1916, a great amount of care was given this old racer, which, on July 4, 1890, won a great race at South Boston, netting Mr. Hanley, the builder and owner at that time, $250.



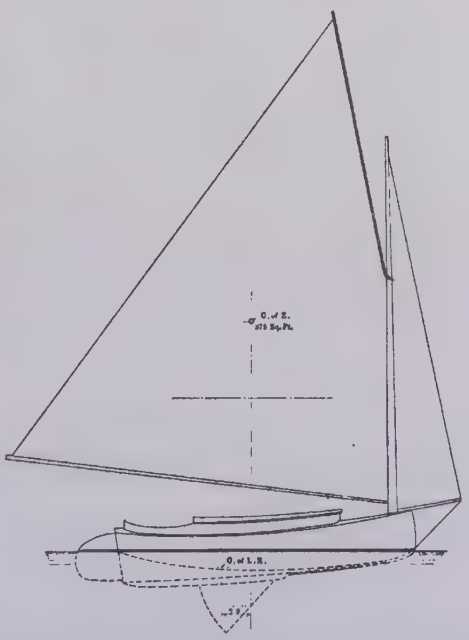
Almira, Champion Class D Catboat

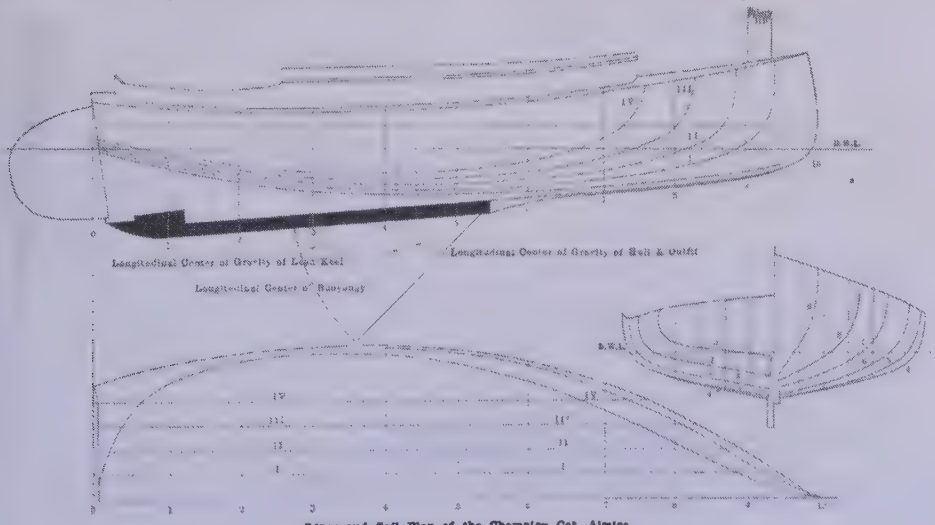
In the Fall of 1915, when the Almira was pulled out, all the ballast was carefully weighed and the exact location noted, also the exact draught forward and aft was taken; later the lines were lifted and a regular set of drawings made up. After due consideration it was decided that a lead keel be fitted, leaving only 600 lb of lead as inside ballast for trimming; 300 lb of this was later added to the keel, the rest being taken out, so that the boat now carries not a pound of inside ballast. It was calculated that with the lead keel the boat is about 7% stiffer than with the ballast inside. This amounts to about the same as one reef and it was several times demonstrated that the Almira can "lug sail" and stand punishment much better with the lead keel than with the inside ballast. The location and shape of the lead keel were carefully computed, and when the boat was launched in the Spring the trim came out exactly as planned. Considerable trouble has always been experienced on catboats in regard to the high-peaked mainsail used on these boats. The long gaff buckles and the peak sags, so that on a long

beat to windward it is almost always necessary to "peak up," during which operation valuable time is lost. To overcome this a very novel arrangement of peak halyards was devised, as may be seen from the photo, and spreaders with wire stays and turnbuckles fitted to the gaff. This proved very efficient and trouble was not experienced from this source any more. The hoops on the mast were the next thing to be scrapped and slide rig fitted instead. The bobstay had also been a weak spot, as the wire rope would rust and weaken (a new 5/16-inch diameter wire rope was pulled apart after two months' service) so a Tobin bronze rod was fitted instead.

The above alterations were severely criticized by all the "wise birds," who would come around shaking their heads and announcing that the boat would be spoiled, as a catboat (for some mysterious reason) should have ballast spread over the floor and out in the wings, and that a lead keel was entirely out of place. In this connection it is also interesting to note that old catboat-men will keep telling you that a catboat (for some other mysterious reason) should have a springy mast, which will whip the boat to windward, and that a catboat should carry no headstay, as they are faster without. Almira, however, has a splendid stick in her which, while it bends some, of course, is the stiffest and toughest piece of black spruce ever seen; she also carries a 4-foot bowsprit and wire headstay set up with a turnbuckle.

Well, to make a long yarn short, it is enough to say that, during the season of 1916, the Almira showed wonderful improvement, making a clean sweep in her class, including the championships of the Massachusetts Y. R. U., Quincy Y. C. Championship, Midsummer Series of Marblehead, Commodore's Cup Squantum Y. C., etc., and as an example of what this old boat can do, it may be mentioned that in a light, steady air in an 11-mile race at Bass Point, she finished eight minutes ahead of the nearest competitor in her own class; finished a few seconds ahead of one of the R boats, which started nine minutes ahead of her, and finished two minutes ahead of the Sonder Tern, which was leading her class, which had started six minutes ahead of the Almira, the R boat and Tern using spinnakers and reaching jibs, while the cats are allowed to use mainsail only.





Lines and Sail Plan of the Champion Cat, Almira

How to Build the 12-Foot Skiff Catbird

By Fred W. Goeller, Jr.

THE main idea in designing this boat was to get one that could be built as easily as possible. It is not intended for the yachtsman as a tender for an expensive yacht, but for the one who wants a plain substantial boat to knock around in.

The sail was added so that additional pleasure might be obtained and while it is moderate, is yet sufficiently large so that the boat will go to windward, with the board down.

For a club that desires an inexpensive plain boat, one that just as much fun can be obtained from as a larger or more expensive boat, this will make an ideal proposition. In this case, however, I would suggest that a larger sail, a regular mainsail, be provided for as it would make keener racing.

In making the plans we have tried to make them as plain as possible so that any one, from a small boy up, could work from them. The dimensions are given for every part and should be followed carefully and then the boat will come out fair and even all over.

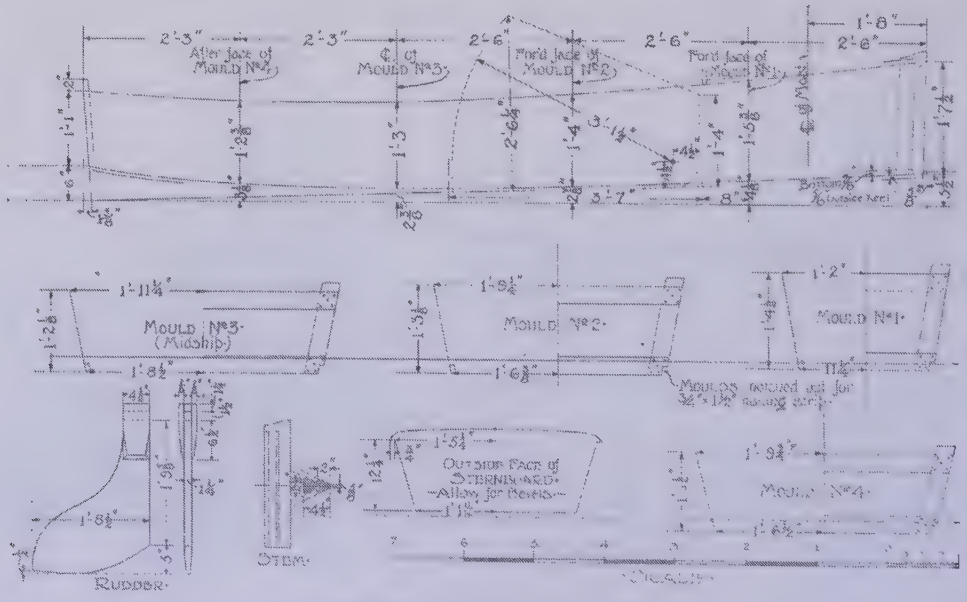
We would suggest that the profile be laid out full size on a sheet of building or detail drawing paper and this kept and referred to until the boat is completed.

The first thing to be gotten out are the stem and the sternboard. For the former use a piece of oak 2½ inches thick, 4½ inches wide and about 24 inches long—some of which will afterwards be cut off, when the boat is finished.

On the narrow face (2½-inch edge) a center line is drawn and then a line either side of it 5/16 inch from the C. L. These two outside lines should be marked heavily as the stem will be worked down to them and they represent the face of it when finished. Then on the flat side (4½-inch width) mark off a line two inches from the face of the stem—both sides—and the bevel is cut from this 2-inch line to the one 5/16 inch away from the center line (face of the stem).

The section of the stem (see drawing) shows how the side planks fit in the rabbet. The way to cut this rabbet is to get a short piece of board the same thickness as the side planks (¾ inch thick) and cut the end off square. Then start cutting a notch out of the stem until this template fits in nicely with the outer face even and on the same angle as the side bevel of the stem. Repeat this at three or four places on either side and then cut out the remaining wood between, until you have a fair cut the full length. This completes the stem and it is a good plan to give it a coat of varnish at once so that it does not check before it is used.

The sternboard is next. If possible, get one board



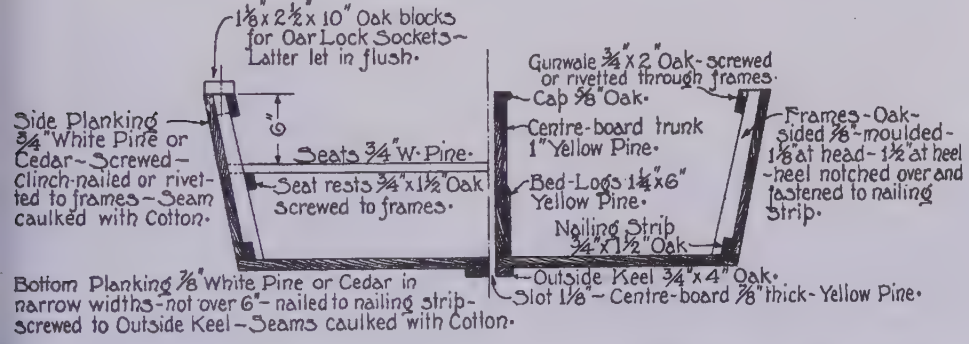
Outline Dimensions, Moulds, etc., for the Catbird

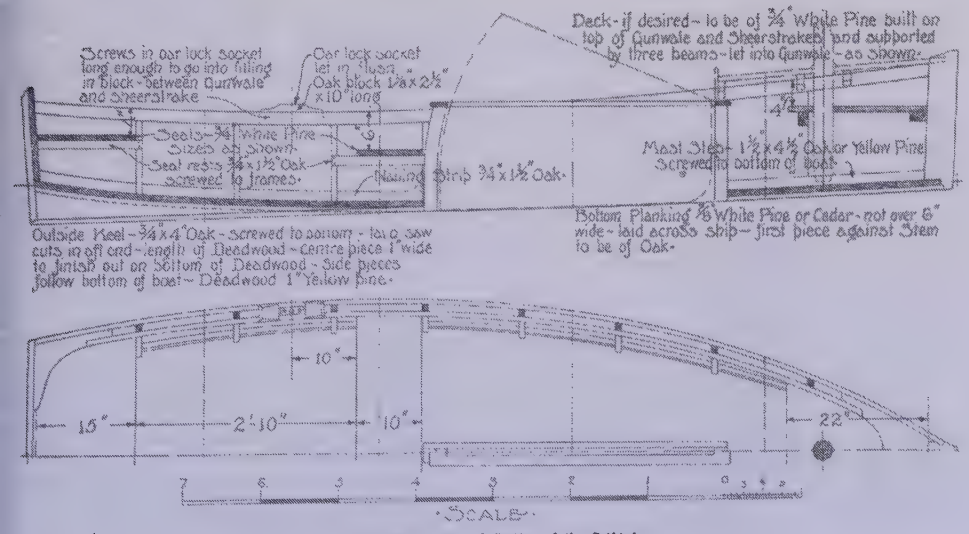
18 inches wide, otherwise it will have to be made of two pieces, doweled together and cleated together on the inside. It should be ⅞ inch thick and in laying out the dimensions given it must be remembered that this is done on the after face and that due allowance should be made for the bevels. These may be obtained from the full-size profile, for the bottom and those for the sides also roughly figured. It is better to have too much, as it can be trimmed off as the job goes along, but if there is not enough, when the sternboard is beveled to fit, the outside face will be smaller than intended and in all probability will be unfair, too.

The moulds are made of ¾-inch scrap, 3 or 4 inches wide and to the dimensions shown. At the lower edges there is a notch cut out ¾ inch by ½ inch for the nailing strip, but this latter is not put in until after the side planks are on.

In setting up the moulds, stem and sternboard, this should be done either on one long horse, the top edge of which should be shaped out to the dimensions shown for the bottom of the boat, or else on stocks set at these heights. The former method is best and much more accurate. They should all be braced very securely, both in an upright and fore-and-aft position, the moulds and sternboard being trued up square with a center line.

The side planks are then put on and as it will be impossible in most cases to get one board wide enough, two will have to be used. The top one is done first. Take a plank about 14 feet long, ¾ inch thick and 11 or 12 inches wide. Clamp it securely at the stem, with the top edge about 21 inches from the bottom of the stem. Then bend it around and either clamp it or have some one hold it at the stern until the top edge of each mould can be marked on the inside face. This angle of the rabbet is





Construction Plans and Section of the Catbird

also marked and the position of each mould. The plank is then taken off and a fair line drawn through the points at the stem and sternboard and at the different moulds, and the wood above this sawn out. Do not cut exactly to the line, but an eighth of an inch outside, leaving the planing up to be done after the frames and gunwale are in.

Next measure off the height at the stem, each mould and at the sternboard and taking one-half of each measurement, mark it off on your plank at the corresponding place and draw a fair line through each point. This bottom edge is planed up fair, with the edge square, and the forward end fitted carefully at the stem. This plank is then fastened securely at the stem and sternboard and with a nail, not driven home, at each mould, to keep it from shifting up or down.

The lower plank is laid out in the same way, care being taken to have it fit nicely at the stem and to have the top edge make a good even joint with the upper plank. The bottom edge is just cut off roughly and faired and finished up after the nailing strip is in.

This plank is also fastened at the ends and with a nail at each mould. The ends projecting beyond the sternboard are sawed off and then the boat may be removed from the stocks.

The next step is to put in the nailing strip. The boat is turned upside down and a piece of ¾-inch oak 1½ inches wide and about 12 feet long is used for it. This does not have to fit snugly against the stem, but a certain amount of care should be taken to have it butt up against the sternboard. It is forced into the space between the side plank and the notch in the mould and when home in this position, is fastened in place by either screws or nails going through the side planking into it.

The side frames are then put in the positions shown. They are notched over the nailing strip and either a long screw or nail through the side plank, nailing strip and into the heel of the frame.

The side planking is then fastened securely to the frames and it is optional with the builder what manner of fastenings is used. The usual practice is either to use screws, nails (clinched), or copper rivets.

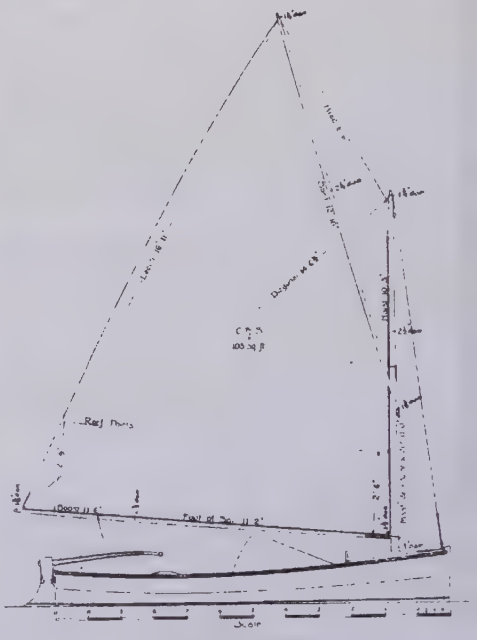
The boat is again turned bottomside up and the side planking and nailing strip planed off square and in an even curve and the bottom is ready to go on. In putting this on one of the best methods is to put some heavy paint on the nailing strip and side plank, then a narrow strip of cotton, some more heavy paint, and then nail down the bottom boards and a tight job will be the result. When the bottom is all on it should be carefully calked, especially in way of the centerboard trunk, and then planed off smoothly and the outside keel put on. The two saw cuts should be made, as noted on the plans, at the after end, but it is not necessary at this stage to put in the deadwood.

However, the position of the centerboard should be carefully marked and holes bored and the cutout made for the posts at the forward and after ends.

The balance of the slot is not cut out until after the bed logs are in. The boat is then turned rightside up, brace put across at two or three places, about 3 or 4 inches from the top, and the moulds removed.

The knees at the sternboard and the breasthook forward are next carefully fitted and fastened in place and then the gunwale put in.

Any braces which may have been put across, in the way of the centerboard, will have to be moved so as to leave a clear space while putting in the trunk. The forward and after posts are 1⅛ inches thick and 2 inches wide and about 17 inches long, the latter one being curved as shown.



Sail Plan for the Catbird

They are fitted carefully into the cuts for them, in the bottom, plenty of white lead having first been smeared in the hole and on the end. The bed logs are then carefully fitted to the bottom of the boat, clamped in place to the upright posts and fastened with long screws up through the outside keel, the bottom boards and into the bed logs. A rivet is then put through the posts, near the top edge, and then the upper ends of the posts are pulled together—forcing the lower ends tightly into place. Then two more rivets are put through each post, completing the lower half of the trunk. In putting on the bed logs and the outside keel in the way of the centerboard slot, it is well to put plenty of white lead and a string of cotton between the two surfaces to insure a tight job. The balance of the slot is then cut out, first boring holes until you can use a compass saw and then a regular one.

The top half of the centerboard trunk is then put on and the ends riveted. This practically completes the boat, except for putting in the seats and, if desired, a deck forward, which are such simple jobs as to require no further instructions.

The diameters of the spars are shown on the sail plan and are gotten out of spruce joists. The sail is, of course, really a job for a sailmaker, although one could, in an emergency, make it himself.

An Eventful Maine Coast Cruise

By Richmond L. Watson



ON a Monday morning in July the 21-foot knockabout Doris left the pleasant waters of Casco Bay, bound East for Mount Desert. It was foggy all about, but we were determined to make a start even if we made only a mile from our home port. With the rays of the sun gradually burning away the haze, we stood for a long tack offshore by Halfway Rock Light until it bore W.N.W. After determining our position by cross bearings, we stood in by Small Point, which was on our beam at 2:30. Going across to Seguin the wind shifted to the S.W., allowing us to set our balloon jib. Near the island the breeze flopped, and a strong ebb tide running out from the Kennebec River set us out to sea.

As we are a bit old-fashioned, the Doris has no power, and the mate climbed in the tender and used several quarts of elbow grease towing the Doris in to Seguin Harbor. This offshore anchorage is seldom, if ever, used by yachtsmen, so we did not drop our bower but tied to the stern of a Government boat. A little later a fisherman, in an 18-foot Hampton power boat, came in to lay there over night. He tied to our stern, thus making, with our tender, four boats in line.

We decided that each of the "merry three" should have his turn at cooking. The Skipper started us going with a delicious vegetable supper. A short time after putting in the fog shut down thick, and Seguin Whistle and the Cuckolds began to talk. Soon after that the mosquitos made us a visit. We put up netting, but a dozen had succeeded in getting in. We turned in, determined not to be annoyed by them, but at midnight they were too much for us. Ultimatums were not bothered with, but war was immediately declared and the enemy promptly routed.

Second Day.—In the morning we visited the lighthouse and whistle station, having an interesting talk with one of the assistant keepers. He showed us a crack in the lens of the big light, which had been made by a fisherman who had tried to put out the light with a rifle bullet. A diligent watch day and night is kept of all passing vessels. The Winter before last a vessel was seen about two miles off the island, sinking. They signaled in to the Life-Saving Station at Popham, and help was immediately sent out. At another time a vessel was dismasted off the island in a fierce storm. In both cases the crews were saved, but the vessels were a total loss. He told us an interesting trick of the tide: the ebb running out from the Kennebec River splits at Ellingwood Rock and runs both sides of Seguin, contrary to the usual rule that the ebb runs West of the offshore islands.

At eleven, a ripping Easterly breeze was blowing, and by 11:17 we were underway. After standing toward the Seguin Ledges, we took a long tack outside. From there we stood in for the Cuckolds, and sailed through the narrow channel between them and Cape Newaggan. It cleared off beautifully, making the sail by Boothbay, Squirrel Island, Pemaquid, and across Muscongus Bay most enjoyable. Off Eastern Egg Rock the wind shifted to the S.W., allowing us to set our balloon jib. As the wind was lightening, we decided not to try Port Clyde, but instead to put in to Georges Harbor. Entering this harbor for the second time recalled vividly to my mind an experience we had during the storm of July 8th. I shall quote from a portion of the log of that date:

"As we sailed by Port Clyde, where a Government Weather Signal station is located, we were surprised to find no storm warning hoisted. Our barometer had been falling all day and the rain was coming down hard. The newspaper of the previous day had predicted only local showers. On the chart we saw there was an apparently well-protected lee between Allens and Burnt Island on the South and Davis and Benners Island on the North, called Georges Harbor. After passing the end of Benners, we saw between it and Allens a fleet of eight sloops and a number of power boats. There proved to be quite a settlement there that we never had heard of before. For years the Skipper had cruised by the Georges Island through Davis Straits to Port Clyde and never dreamed of such a fine, well-protected harbor



21-Foot Knockabout Doris

and of such a settlement. It is an important harbor for yachtsmen to know of, as it is the first good anchorage East of Muscongus Bay, and the inner harbor affords much better protection than Port Clyde.

"There was every indication of a storm coming, so we put out two anchors and ran a line ashore, which we tied around a stake driven deeply in the ground. The rain continued to fall and the wind began to howl from the East. In order to have some shelter in the cockpit, we put up our big khaki awning. The downpour was so great it became necessary to set basins and kettles to catch the drip, and they were soon filled and refilled. A lobster smack came in, and after putting out an anchor, she ran a line ashore to be snug for the storm. The Skipper attempted to put out the riding light, but the hard gusts of wind would not allow it to stay lighted. Finally we put it in the cockpit in the lee of the cabin. At one o'clock, we were awakened by the wind whistling through the rigging and the rain beating against the cabin roof so hard it sounded like gravel. The awning was beginning to flap and we knew if we did not get it in it would blow away. We cut away the stern lashing and rolled it forward. The wind would catch it sideways, making it very difficult to control. The barometer had fallen .38 during the night. The Skipper, who went through the terrible hurricane of September, 1906, in the Gulf of Mexico, said some of the gusts reminded him of that experience. The storm being circular, the wind during the night swung from the East, by the way of the North to Northwest. This cleared it off beautifully, but the wind did not abate, and the next day the bays around were feather-white.

"Our tender was three-quarters full of water, an evidence of the hard rainfall during the night. The marshes on Benners Island were small-sized lakes. One of the fishermen there said it was the worst summer storm he had seen for twenty years. The settlement on the islands proved to be a summer colony of fishermen who pay a dollar a month for the rent of their little houses. A great many sheep are raised on the islands and the 'baa' of the lambs for their mothers could be heard everywhere. In 1605, George Weymouth, the famous English explorer, anchored in Georges Harbor, and on Allens Island a huge granite cross is erected to his memory. No one would have known the exact harbor where he put in but for the fact that he described it as having three entrances and as being near the Thompson River. Georges is the only harbor on the coast answering this description. One fisherman told us it was the finest outside harbor on the Maine coast. During the storm, in which the Portland went down, a big schooner came in. It put out an anchor, ran a line ashore and rode out the storm with ease. In the latter part of the afternoon a school of pollock came in. We dropped them a line and in a short time had fish enough for supper."

This memory of my first visit to Georges Harbor flashed over me as we lay peacefully at anchor in its pleasant waters.

Third Day.—At 8:10, with a very light S.W. wind, we started for Isle au Haut. With the breeze dead aft, setting the spinnaker increased our speed. Going across to Metinic there was so much seaweed about that it was like sailing on the Sargossa Sea. Passing Metinic at just twelve, we laid a compass course E.½N. for Bay Ledge Buoy, which is 13½ miles West from Isle au Haut. A short time after leaving Little Green, the "islands with height" became distinguishable. When about two miles from Bay Ledge, the wind began to die out and Isle au Haut began to be shut out by a thickening haze. Gray clouds banked against the sun made us fear a storm was coming. Our faithful barometer was commencing a downward journey. Newspaper reports had predicted no storm, but we had learned from our experience at Georges Harbor that clouds and a barometer do not lie. We decided to run for Carvers Cove, Vinal Haven. As we neared the breakers, a line of wicked ledges just outside the harbor, where the waves piled up in a ceaseless roar, the wind died out. The Skipper gave us a tow until we were lifted in the harbor by the two-masted fishing schooner Miniola. The channel leading into the harbor is very narrow, but once inside, you find yourself landlocked and completely sheltered from all winds.

Fourth Day.—Sure enough, a hard rainstorm came during the night and lasted all day. Here I must tell you about the Doris's famous cuss-box. The habit of using expletives, strong as well as mild, is easily acquired by cruisers, and it is apt to be embarrassing if on their return home they forget they are not at sea. We formed this plan—every time any one used an expletive, from a mild "gracious" to a full-grown "damn," he must put a cent in a box. The mate was duly appointed official cuss-box keeper, and every time a person let out one he jotted it down in a little book.

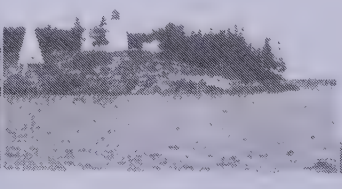
At the end of the day the members of the crew and the Skipper himself were handed bills. The cuss-box increased in weight on rainy days and when the stove didn't work. Not only did it help us to better our vocabularies, but it made fine ballast. The Skipper would occasionally get peeved at the "Recording Angel" for so carefully keeping his records and "damn" the cuss-box, following which another cent was slated against him. On bargain days, six cusses for a nickel were allowed.

Fifth Day.—At 11:32, with a light Southwest wind, we beat out of the narrow entrance of Carvers Harbor. Our original plans were to try for Isle au Haut, but with a light breeze and a fog gradually drifting in, we decided not to make the dash across the bay, but to follow along the shore to Fox Island Thorofare. It was a beautiful sail by Heron Light, situated on a bluff surrounded by trees, and along the granite shores, broken by nubbles and hills, up Hurricane Sound. The channel close to Vinal Haven is narrow and very crooked, being full of numerous unmarked ledges. It took fine navigation to dodge them, but we never once scraped our keel. The fog chased us along, but seemed to keep a mile astern. The coast was dotted by many deep and picturesque coves, which added to the variety of the scenery.

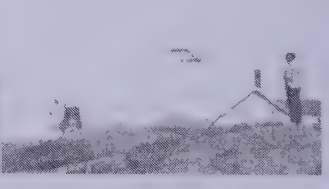
Our breeze increased and carried us along to Browns Head Light, which marks the West entrance of the Thorofare, at a good clip. As we sailed up the landlocked channel, it was difficult for us to realize we were on the ocean. The Thorofare is very narrow except for one place, where it is broken by a deep bay, and its shores



Heron Light



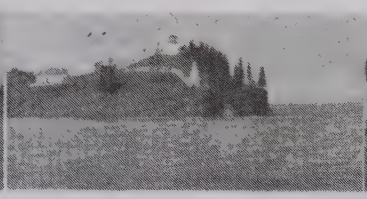
Burnt Coat Light



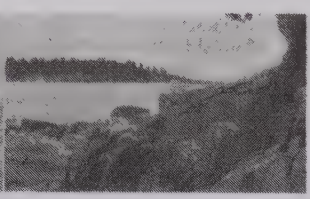
Visiting the Whistle Station



Browns Head Light



Owls Head Light



Cliffs on Swans Island

are beautified by spruces and granite bluffs. We passed the prosperous town of North Haven, where hundreds of magnificent yachts and beautiful summer homes (one cannot call them cottages) could be seen. We sailed along the green shore until we came to Carvers Cove, a deep indentation at the East entrance, where the fog shut in so thick we were not able to distinguish Goose Rock Light until within a short distance of it. The clear note of its bell could be heard for a long distance. We sailed by the Naval Hospital and anchored in Carvers Cove at 6:52.

Sixth Day.—A fog so thick one could almost cut it kept us in port all day. Our morning was spent by a walk through the woods to Winter Harbor. In the afternoon the mate rowed down to North Haven and back in the fog. The distance was six miles and he did it in two hours. At eight o'clock, we went out on deck and our shadows, reflected from the cabin light against the fog, looked like ghosts.

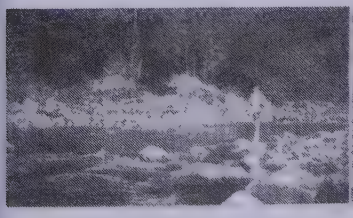
Seventh Day.—Around noon our friend the fog decided he had visited us long enough and we were underway with a light Southeast wind, which slowly carried us by the Naval Hospital. After being becalmed for an hour, an Easterly breeze sprang up, forcing us to beat across to Deer Island Thorofare. Going across East Penobscot Bay we could see up towards Castine, down to Isle au Haut, the whole of Vinal Haven and the granite quarries on Deer Isle, giving us a commanding view of the surrounding country. We sailed by the immense quarries and bold shores, a large part of which had been excavated, to the village of Stonington.

The Doris found a comfortable resting place for the night amid a fleet of eight or ten coasters, the most of which were laden with granite. From Deer Isle were selected the crew of the Columbia, who twice won the America's Cup race. Most of the fishermen have Friendship sloops. They are on the water almost as soon as they can walk, giving them from childhood the best kind of training to make them good sailors.

Eighth Day.—With fog all about, but with the Thorofare clear, the Doris left Stonington around seven. The fog decided to play no favorites, and before we were halfway through the Thorofare, it shut down thick. We could hear two whistles every minute, and we kept our eyes open for a sailing vessel on the port tack. Our horns kept up a merry conversation until finally a pretty 18-foot knockabout hove in sight. The wind died out, so we put in to Devils Harbor, near Bald Island. Jupiter Pluvius gave us a little variety in the line of weather by making use of his sprinkler. At 2:30 the mate had her underway for the second time. The breeze took us along to Lazygut Islands, where it flopped, and our "friend," the fog, came in.

After we had anchored for a short time a fresh Northeast wind sprang up, and we got her underway for the third time. The brisk wind was clearing away the fog, and we soon sighted Swans Isle and Casco Passage, which leads into Blue Hill Bay. It breezed up to a moderate gale and the fresh gusts soon made whitecaps. We were proud to find our boat stiff and handled easily. Near Casco Passage we put two reefs in our mainsail and changed our regular jib to a storm one. We had been complaining for lack of wind and it was a great pleasure to have a two-reef breeze. As we went through Casco Passage, we passed the two-masted coaster Puritan bowling along at a great clip. Being reefed down snug, we decided to make the run across Blue Hill Bay to Bass Head Harbor, Mount Desert.

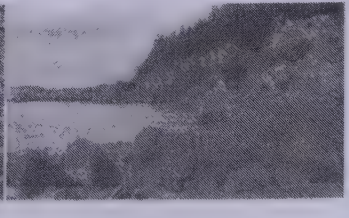
After leaving Casco Passage, the wonderful Mount Desert hills, the tops of which were enveloped in a cloud of mist, became visible. It did us good to have the fog blow away and see the clear outline of the coast. It grew dark a short time after we left the Passage, and we put up our sidelights. A golden glow on the Western horizon gave us hopes of a good day on the morrow. Baker Island Light showed up very brightly, but Bass Head Light we could not distinguish. According to the Coast Pilot, it was a steady red light, visible 11½ miles. As we were 5 miles from it and getting nearer every minute, we wondered what could be the matter. We could get its general position from the sardine factories' lights at Bass Harbor and from Baker Island Light. It was an exhilarating sail across the bay in the black night, with the Mount Desert hills looming up and the hard North-



The Skipper at the Head of the Cove



We Took a Walk Through the Woods



The Rugged Shore Line

east wind blowing. As we neared Bass Head at 8:30, the light suddenly flashed up. After following along the low, black shore, we anchored in Bass Head Harbor at 9:30.

Ninth Day.—The inhabitants of Bass Harbor did not have a great deal of time to find out who we were nor whence we came, for at eight o'clock we were on our way to South West Harbor. A dry Northeaster made it an exceptionally clear day. Every outline of the grand Mount Desert hills stood out beautifully as they looked down upon us from their majestic heights. The round, humpy backs of the Western range made them look like enormous elephants lying down. Crossing Bass Head bar, the strong flood tide rushing against the wind made a heavy chop. We beat up the Western passage and decided to put in to North East Harbor, where the Doris lay at anchor around ten. This haven is a deep indentation on the South side of Mount Desert. On the right hand, facing North, a beautiful green hill slopes to the water's edge, while on the left-hand shore can be seen many beautiful cottages. Looking towards the head of the harbor you can see the higher Mount Desert hills. This harbor is 19 fathoms deep nearly up to its head, but once there, splendid holding ground can be found in mud bottom. This and South West are by far the best sheltered harbors on the island. With such a wonderfully clear day before us, we decided to climb Green Mountain, the highest on the island. It is an interesting fact that the Mount Desert hills are the highest summits on the Atlantic Coast. Mountains near the ocean are always much more impressive than those inland. The mate found the boat left for Bar Harbor at 1:35, which we decided to take. Our chronometer, a cheap watch belonging to the Skipper, was fifteen minutes slow, resulting in our missing the boat. This did not discourage us, and we took the 2:50, landing us in Bar Harbor at ten minutes of four. We knew that if we expected to go the 8-mile climb to the mountain and back in time for the last boat, which left at 7:30, we could not pick daisies along the wayside. The shortest way to the top we found to be by trail. After passing down Mount Desert Street and crossing a little stream, we entered the trail. It wound in and out of a thickly wooded country, twice crossing a pretty flowing brook with trees hanging over its edge. After passing the Kebo Valley Club, the trail was very steep and we had to dig our toes in until we reached the top of White Cap, which is 925 feet high. From there we followed along the North Ridge to the summit. The trail is very well marked, stones being placed in the form of a bridge at every 50 feet or so, this commendable work having been done by the Appalachian Club. So long as you can look through the bridge you are on the right trail. As we reached the summit we took a look around. In no time our tired muscles were rested from the stimulation of the grand view before us.

I can give but a rough outline of the most impressive and awe-inspiring view I have ever seen. In the West we could see the Camden Hills, Vinal Haven, Swans Island, Isle au Haut, and, in fact, the whole of Penobscot Bay; in the South, Mount Desert Rock, 22 miles out to sea, could be distinguished; in the East, Grand Manan, a blue line on the horizon, Petit Manan, with its high lighthouse, and all the Eastern Maine coast loomed up; and in the North a line of blue hills dotted the horizon. We could see a power boat near Seal Harbor, with an enormous wake, which must have been going at a tremendous speed, but the distance was so great it seemed to be moving at a snail's pace. After twenty minutes at the summit, we started down to make a try for the 7:30 boat. We found a shorter but steeper trail, which helped us gain time. We "piked" it along at a 5-knot gait down the steep trail. Seventy minutes after leaving the summit we were near the steamboat landing at Bar Harbor. Few, if any, others have come down the 1,500-foot mountain in such quick time. After a most enjoyable trip down Frenchmans Bay we landed at North East Harbor about 8:30.

Tenth Day.—At 10:30, with a light Easterly wind, we started back West. In a short time we slipped out of North East Harbor, with the Mount Desert hills and their pleasant memories on our stern. With a fair tide, we shot across Bass Head bar and headed across for Casco Passage. As the wind was dead aft we set our spinnaker, which carried us across Blue Hill Bay at a good clip. We decided to cross Jericho Bay to Eggemoggin Reach. A fine breeze sprang up and it was only a short time before we entered its waters. The low banks on the sides of the Reach made it seem like sailing up some beautiful inland river. We found ourselves landlocked, sailing by well-cared-for farms. For variety of scenery and for deep indentations, thoroughfares and bays, the Maine coast has no equal. It is said if the indentations of the Maine coast were stretched out in one line they would extend from Boston to Mexico. For a "change" our friend the rain visited us. We sailed by Sedgwick to the famous Punch Bowl at the West end of the Reach, and anchored for the night.

Eleventh Day.—At 7:15, with a single reef and a storm jib, and with a howling Easterly rainstorm on our backs, we were underway. We whizzed through Eggemoggin Reach into Penobscot Bay at a good 5-knot gait. Going dead before it, with the seas yawing her back and forth, we had difficulty in keeping her from jibing. There was danger of the seas washing into our tender and turning her over, so we decided to use oil. The Skipper filled an ordinary tin can three-quarters full of oil and punched a small hole in the bottom. This can he tied to the end of the bow, the small hole allowing the oil to ooze out slowly. It was astonishing the difference it made. Our wake was oily 500 feet astern, and it eliminated all danger of the water either breaking in our tender or over our stern. It lifted, or, rather, the drenching rain stopped long enough for us to get a glimpse at the Camden hills. We laid a compass course S.W.¼W. for Owls Head.

After passing the picturesque Owls Head Light, we stood down through Mussel Ridge Channel. It began breezing up so hard we decided to put in another reef. We dodged behind an island, and with only fifty yards between us and the shore we reefed and were about on our course in five minutes. After passing Whitehead and standing across to Mosquito Island bell we began to feel the heavy seas the storm had kicked up. First we would shoot up on the top of a high one, then down in a deep valley out of sight of land. A big yawl passed us with three reefs in her mainsail and a single jib. She was the only yacht we saw out in the whole of Penobscot Bay. As we shot by Port Clyde at 2:40, we saw no storm warnings hoisted. Whether it was the Democratic Administration or Jupiter Pluvius that had played havoc with the weather bureau I cannot say. The beautiful white horses piling up on Mosquito Head and the enormous seas breaking around Georges Islands were an impressive sight.

Going across to Davis Straits an extremely hard puff

took on and with the wind dead aft, the man at the wheel had his hands full. It was a grand sight to look over our stern and see the feather-white bays with black gusts flying over the water. We noticed after leaving Eastern Egg Rock a lull in the storm and that there were longer intervals between the hard puffs. Near Pemaquid the wind died out and we practically lost steerageway. It was roll and slat, with the boom trying to take your head off, for a short time. A black, windy-looking formation was fast coming towards us from the Northeast, and we kept our eyes "peeled." A whiff of wind, which was in no time a fresh breeze, told us a squall was coming. We luffed up off Pemaquid Point and put in two reefs. We had no more than done so when the squall struck in full force, making us very glad we were snug.

It was a pretty sail up Johns Bay to the historic town of Pemaquid, where we dropped our bower in the inner harbor at 6:45. The ruins of the old English fort William Henry are still standing. A tablet near a fine reproduction of the old fort says: "Many shells fell in this vicinity during the bombardment of Fort William Henry in the French-Indian War." Day's run 60 nautical miles.

Twelfth Day.—At 6:50 we weighed anchor and, in a short time, with a fair wind over our stern, we left Johns Bay. At the end of Damarscove we set our spinnaker. From a good 5-knot gait we shot up to seven. We certainly "nibbled the miles," as Captain Slocum says, going down to Seguin. Seventy minutes after leaving the North end of Damarscove, the South end of Seguin was on our beam, a distance of 8¼ nautical miles. It blew so fresh we took in our spinnaker, replacing it with a jib. Going across to Small Point we saw a sloop having a hard fight to make headway against the heavy seas. Her skipper finally put her about dead before the wind towards Harpswell.

A black squall had formed in the Southwest, and with the wind increasing every minute, we decided to put on our storm jib and shorten our mainsail. On another trip between Small Point and Baileys we saw a school of black fish and fin-back whales. We all saw them in different directions and you could hear us exclaiming for miles around. One came up within ten feet of our bow, took a look at us, and, seeing we were harmless, sounded. They went in pairs and stayed on the surface, rarely sounding. It was a short sail by Jacquish bell and across Merriconeag Sound to our home port, Harpswell. At 12:15 we lay at our mooring, bubbling over with the memories of our delightful cruise.

The Screw Propeller Explained Simply

By Charles Desmond

PART IV—(*Concluded*)

AS I find that there is a great deal of misunderstanding about hull resistance, power available for turning propeller, and about propeller efficiency, I will explain these things with sufficient detail to enable a layman to clearly understand them. I will explain the hull resistance problem first.

The resistance that water offers to the passage of a boat is partially due to weight and bulk of hull, partially due to the form of hull, and partially due to friction of water on the immersed surface, and while it is possible to correctly determine laws of resistance as applicable to partially immersed bodies moving at known speeds in still water, it has not been possible, *without making use of the law of comparison,* to find a simple formula that can be used for the purpose of determining the *actual* resistance a certain boat or vessel will encounter when being driven at a named speed. The best that the most expert of designers can do is to use the law of comparison and determine the h.p. necessary, or resistance, from the known performance of a similar boat. This is the most accurate method known and the one universally used by naval architects all over the world.

If data of a known similar boat is not available one of two things must be done. You can either select boats as nearly as possible similar to yours and from their resistance and power data plot curves of speed and power and then determine (guess) just where your boat will come in, or you can use one of several formulæ for approximately determining power, some of which use the law of comparison, while others ignore it. You must, however, bear in mind that nearly all of these formulæ call for the selection of some coefficient and the accuracy of results depends upon the correctness of the coefficient used.

When the i.h.p. to be used is known, one or the other of the following formulæ can be used to determine the possible speed of a boat:

8.—

$$\sqrt[3]{\frac{\text{I. H. P.} \times \text{midship performance coefficient}}{\text{Area of midship section}}} = \text{speed.}$$

9.—

$$\frac{\sqrt[3]{\text{I.H.P.} \times \text{displacement performance coefficient}}}{\sqrt[5]{\text{displacement}^2}^*} = \text{speed.}$$

In these formulæ it is assumed that resistance varies as the square of the speed and work to be done as the cube, and this assumption is correct so long as speed does not exceed the limit when wave-making resistance becomes of more importance than frictional. When this limit is passed the variation will be greater than square of speed. It is also assumed that resistance varies as the area of midship section or as the two-thirds power of displacement. Both formulæ call for the use of coefficients that vary with each change of form, size and speed of boat; it therefore is evident that they cannot be used with any degree of accuracy by men who do not have at their disposal reliable data of known performances of boats and tables of their coefficients, and as the majority of readers of this article will be men of this class, I will explain a formula that can be used with a fair degree of accuracy by anyone who will take the trouble to obtain a few accurate measurements and particulars of a boat. The formula will give accurate results when boats are of ordinary form and speeds are moderate (below that at which wave-making becomes

*The two-thirds power of displacement, the displacement being expressed in tons and fraction of a ton.

important). This formula is based upon these assumptions:

1st.—That area of midship section furnishes the chief measure of resistance, each square foot of it requiring a certain force to drive it through the water, this force varying with angle and length of entrance and run, and with speed.

2d.—That the area of surface immersed furnished another measure of resistance, each square foot of it requiring a certain amount of power to overcome the friction of water on it, this power varying with length of surface, its smoothness and also with speed.

3d.—That resistance varies as the sine of the angle of entrance lines and as the square of speed.

The calculation is divided into two parts, one dealing with resistance due to form and shape, and the other with surface friction. For the resistance due to form of boat, the formula is

10.—H × Co. × A = power required to overcome form resistance at speed named.

H standing for h.p. figures taken from table.

Co. being a coefficient for form obtained in the manner explained below.

A standing for area of midship section.

The coefficient used is obtained by dividing the extreme breadth on L. W. L. by the length of entrance lines (distance midship section is from bow) and squaring the quotient.

For the surface friction resistance the formula is

11.—$\frac{I \times F}{R} \times H$ = Power required to overcome skin friction.

I standing for immersed surface in square feet.

F standing for frictional resistance per square foot, taken from table.

R standing for head resistance for speed, taken from table.

H standing for h.p. figures for speed, taken from table.

Those who do not know the immersed surface of their boats can calculate it by using the following formula:

12.—$L \times D \times 1.7 + \frac{V}{D}$ = Immersed surface.

L standing for length on L. W. L.

D standing for mean draught of water.

V standing for volume of displacement (cubic feet).

If the figures obtained by making the two calculations are totaled and to the total is added a proper percentage to cover engine power used to overcome friction of moving parts of engine, power used to overcome friction of propeller shaft, etc., and power lost through slip of propeller, the i.h.p. (indicated horsepower) required to drive boat at named speed will be determined.

Remember that the i.h.p. is not the same as the b.h.p. Explanation of this is given under *Power*.

You will note that all boat measurement figures required for these formulæ are obtainable by making a few accurate measurements of a boat. The other figures I give on a table printed at end of this article. For the purpose of explaining the application of these formulæ I will make a complete calculation to determine the power necessary to drive a boat, particulars of which I have entered on the boat portion of suggested propeller information blank (p. 545, Dec., 1916). First I will determine the coefficient and area of immersed surface. For the coefficient calculation we have: breadth on L. W. L. 12 feet, and length of entrance 32 feet. Therefore we have

13.— $\frac{12}{32} = 0.375$. $0.375^2 = 0.140$ coefficient.

For the area of immersed surface we have

14.— $55 \times 3.15 \times 1.7 + \frac{805}{3.15} = 549$ square feet.

For the form resistance part of calculation we have

15.— $5.5 \times 0.140 \times 27 = 20.79$ h.p. required.

And for the surface friction resistance we have

16.— $\frac{549 \times 0.53}{209} \times 5.5 = 7.64$ h.p. required.

The total of these two items is $20.79 + 7.64 = 28.43$.

Now to this total there must be added a certain estimated amount to cover losses due to friction of moving parts of engine, propeller shaft and propeller losses. For small powers such as we are dealing with the addition should be about 50%. Therefore we have

17.— $28.43 + 14.21 = 42.64$ as the i.h.p. necessary.

I will now take up the second item—power available for turning the propeller—but before doing this I will complete the resistance part of the calculation by calculating resistance of hull in pounds at the speed named. The formula for this calculation is

18.— $R \times Co. \times A + I \times F$ = Resistance.

For explanation of meaning of the letters see calculations 10 and 11. Using the proper figures the calculation works out

$209 \times 0.140 \times 27 + 549 \times 0.53 = 1{,}080$ lb resistance.

Power Available to Overcome Resistance.

The power actually developed inside cylinders of engines is termed the indicated horsepower (i.h.p.) from the name of the little instrument used (an indicator) when making such calculation. This power is a measure of the actual power developed inside cylinder and is always more than the brake horsepower (b.h.p.) by the amount of power used up by engine in overcoming friction and inertia of moving parts. You can readily understand that the loss from these causes will vary with design, with workmanship and with materials. (The better these are the lower loss will be.) It may be as low as 10% of the i.h.p. of engine, and may rise to as high as 25%. It is always least when an engine is running at the number of revolutions at which it develops its maximum power. The loss in a well-designed gas engine of the sizes we are writing about will approximate 15% of the i.h.p.

The i.h.p. of our engine is 42.64, and let us suppose that when it is running at its maximum power 15% of this power is used up in overcoming friction of moving parts, etc. (15% of 42.64 = 6.39). If we deduct this from the i.h.p. figures the b.h.p. of engine will be ascertained.

19.— $42.64 - 6.39 = 36.25$

and this is the b.h.p. of the engine.

If now you want to ascertain the actual power available at propeller end of shaft you must deduct from the b.h.p. figures the power used up in overcoming the friction of rotating propeller shaft in its bearings, etc. This will approximate, in engines of the size and type we are dealing with, 5% of b.h.p. (it will be much higher than this if alignment is poor and bearings unlubricated). 5% of b.h.p. is 1.81, therefore we have

20.— $36.25 - 1.81 = 34.44$ as power available at end of propeller shaft.

If now you want to ascertain the actual power available for propelling the boat, you must deduct from the

power at end of shaft a percentage to cover power lost by slippage of propeller. For boats of the type I am writing about a 20% is a good percentage to deduct. 20% of 34.44 = 7.25, therefore we now have

21.— 34.44 — 7.25 = 27.19 h.p. available for actually driving boat ahead.

From this explanation you can readily understand the importance of being able to determine the power of an engine at three or four points.

1st.—The power inside cylinder, termed the i.h.p. (indicated).

2d.—The power at flywheel of engine, termed the b.h.p. (brake).

3d.—The power delivered to end of rotating propeller shaft.

4th.—The power actually utilized to move hull, termed e.h.p. (effective).

In practice between 45 and 65% of the i.h.p. of an engine is all that is available to actually drive a boat ahead.

22.— $\frac{\text{E. H. P.}}{\text{I. H. P.}}$ = Propulsive coefficient.

For the boat our calculations refer to the propulsive coefficient is $\frac{27.19}{42.64}$ = 0.63 propulsive coefficient.

All that now remains is to determine the theoretical propeller thrust necessary to overcome the resistance. This you can quickly ascertain by multiplying the b.h.p. by the figures for named speed entered in thrust column of table. For our calculation the figures are 36.25 and 35. Using these for a calculation, we have

23.— 36.25 × 35 = 1,268 lb theoretical thrust.

I will now complete my remarks about propeller efficiency. There is no simple formula that can be used to definitely determine the dimensions of propeller that will be best suited to a certain boat. The most accurate and efficient method of determining the size of propeller to use is to make use of the law of comparison and calculate from known efficiency and particulars of propellers in use on similar boats. In practice, it is possible for every propeller maker to actually determine, by making tank tests, the thrust and efficiency of every propeller and from results obtained by making these tests curves can be plotted from which can quickly be determined the most efficient propeller to use under conditions named.

If a propeller maker knows the conditions under which a propeller will operate, the resistance water will offer to the hull, the revolutions of engine, and the actual h.p. available at the end of propeller shaft, he can come pretty near to selecting the most suitable diameter, blade area, and pitch of propeller every time. But these particulars are seldom supplied and one of the purposes of this article is to call the attention of boat owners to their importance.

TABLE OF RESISTANCE FIGURES

Speed per Hour in		Head Resistance per Sq. Ft.	H.P. Fig. per Sq. Ft.	Thrust Figure	Skin Friction per Sq. Ft.	
Knots	Miles				20 Ft. Length	40 Ft. Length and Over
1	1.16	2.55	0.008			
2	2.30	11.40	0.07			
3	3.46	25.67	0.24	81.5		
4	4.61	45.84	0.56	66.0		
5	5.76	71.31	1.09	54.1		
6	6.91	102.68	1.89	46.5	0.27	0.25
7	8.07	139.76	3.00	40.6	0.38	0.35
8	9.22	182.55	4.48	37.7	0.49	0.46
	10.0	209.00	5.50	35.0	0.53	0.50
9	10.37	231.04	6.38	32.5	0.61	0.58
10	11.52	283.23	8.76	29.4	0.73	0.70
11	12.68	345.13	11.66	27.2	0.87	0.83
12	13.83	410.74	15.13	25.1	1.01	0.98
13	14.98	482.05	19.24	23.2	1.20	1.10
14	16.14	559.05	24.03	21.7	1.42	1.25
15	17.29	641.72	29.56	20.1	1.66	1.31
16	18.44	730.20	36.34	19.1	1.90	1.48
17	19.59	824.33	43.03	18.0	2.16	1.60

(*The End*)



A Close Contest Between Two High-Speed Boats

Auxiliary Power for Sailing Vessels

A Practical Aspect of the Situation

PART I

THERE hardly is a more serious and less properly understood problem than that of auxiliary power for sailing vessels used in the mercantile marine, and the matter is absolutely different from the question of auxiliary power for sail pleasure-craft, where the yacht owner's chief deliberations are concerned with "personal attitude," "first cost," and the "encroachment on living accommodation space." In cases where ships are trading for profit, so many important considerations have to be taken into account that the owner who installs an engine merely because it will enable a sailing craft to proceed on her voyage in a dead calm or against adverse winds and tides, is simply asking for trouble, and one case of failure will undo all the good made by a dozen well-thought-out and successful installations. There are many auxiliaries giving splendid service, and investigation will reveal the presence of study and discrimination. A moderate number of successful auxiliaries is better for the engine business than countless numbers of indifferent, non-paying jobs, and the ship owner must be impressed with the fact that the marine engine is a pronounced economic if properly used.

At the present time conditions in the mercantile marine are abnormal, and many sailing ships that were practically ready for the scrap heap years ago have been revivificated and now are earning enormous dividends, either by charters, sub-chartering, or by direct cargo-carrying, for their owners. This extraordinary situation cannot much longer prevail, for it is purely the outcome of the chaos of war; in other words, it is the result of unnatural business conditions, and so must re-act, and re-act again, until the normal state prevails. It is the problem of the auxiliary engine in normal times that must be considered in this discussion. What will favor auxiliaries in normal times will trebly do so now.

At the moment many owners would pay enormous sums if they could install mechanical motive power into their sailing ships without delaying the latter in their active operations—because they fully realize what the advantages of immediate auxiliary power would mean without regard to the fundamental aspect. Yet today the high freightages in force are producing such huge profits for the owners of sailing ships that it might mean too much loss to consider dry-docking them for the time required to install the machinery, particularly as the freight rate slump may possibly come while a ship is under conversion, and owners are anxious to make hay while the sun is shining, also the owner has to consider possible risk of delay due to a fault, or error, of the installation or equipment, and the consequent loss of earnings while alterations and repairs are being made, for anything mechanical is subject to mishap.

This is the position of the commercial sailing ship owner today, and so must be looked squarely in the face, without any self-disillusionment. But the man who has power in his ship when the promised slump comes will be at a great advantage. Quite a number of owners, particularly in the lumber trade, are having new auxiliary power ships built up to 600-h.p., and several will soon be in active operation.

When normally good and bad times are before a ship owner the question of auxiliary power must be based upon the functions and service-route of each individual sailing vessel, except in the case of sister ships in the same trade when, what applies to the one naturally is applicable to the other.

First of all, an owner has to raise the following question—Does my ship maintain a good average speed, and would she maintain substantially a better speed if equipped with auxiliary power? This is obvious because the ship represents so much return upon the cash outlay, and a greater number of voyages per year means increased profits, provided, of course, good-paying cargoes can regularly be obtained. Secondly, will the better speed attained with power more than average in a year, the little loss of cargo space occupied by the machinery? The probable emphatic answer will be—yes! Thirdly, he has to ask what type of mechanical power must be installed to obtain the most favorably all-round results, i. e., steam, electric, suction (producer) gas, or oil engines? The answer is so well known that then he has only to study the individual merits of the types of internal-combustion engines, and this in a great measure depends upon the local supply of fuel. If the producer-gas and oil fuel questions leave little to choose from, the owner must consider which, by reason of experience and proven reliability, is most likely to give him the best service.

Next, it is necessary to work out the most economical speed under power, and then decide upon a horsepower that is a little more than sufficient for the purpose, so that there is a slight emergency reserve available.

The greatest problem is—What is this economical speed? Upon what basis is it to be calculated or assumed? These points are vital, and light treatment may result in the engines being ripped out, after a year, more or less, and both the engine builder and owner naturally desires to render nil such a possibility.

For use at sea anything under 6 to 7 knots (7 to 8 miles an hour) cannot be considered, otherwise the ship would merely do a little more than drift in a good tide and no breeze, and would be incapable of plugging against a head wind. If only required for docking, less speed would be necessary. Again there is a limit to the amount of power that can be installed with the best commercial economy, and the larger the sailing ship the more important does this become, as, with increased size, the type of machinery becomes more elaborate, and expensive per b.h.p., and because after a given size the mechanical features of the engines, and engine room auxiliaries, mean an almost similar staff to that of a full-powered ship, also the up-keep is nearly as much. Again, with the addition of a little more power, the sail, masts and rigging can be discarded and polemasts substituted, making her a more economically-operated full-power ship because the gain incidentally would more than compensate the additional fuel bill. Hence, it easily is realized that



San Antonio, a 500-Ton D. W. C. Auxiliary, Equipped With a 160-B.H.P. Diesel Type Heavy-Oil Engine, Driving a Feathering Propeller 300 R.P.M.

an auxiliary that can show 10 to 12 knots under power alone, is not a commercial possibility, except under most special conditions of service-route.

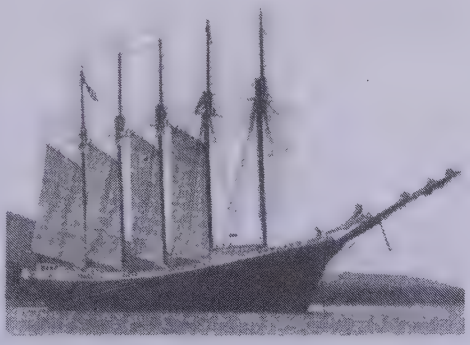
It is no use shutting one's eyes to blunt facts that the account books of ship owners reveal, so it is better to boldly review the position. Why this is so will be understood when it is pointed out that the expensive sails and rigging (with their renewal costs) of a sailing vessel are continuous. This up-keep, with the wages of the large deck crew necessary, are always being maintained when running under power; and that when sailing under canvas, the large cash outlay in the machinery is idle and non-productive; in fact, is to an extent an expense, because the engineers are receiving their wages, and a certain amount of insurance charges and depreciation are constantly in force. This particularly applies to the large type of auxiliary, so it will be seen that, given a suitable route and a well-thought-out installation, occasionally running under sail and power at the same time could be made practical. Full appreciation of this by the ship owner is better for the engine builder, because he gets the benefit of the extra power sold.

Conversation with several sailing ship owners reveals the fact that they are seriously considering turning their craft into full-powered vessels when business slacks up somewhat—others already have done so. Here it may be mentioned that some ship owners, while they would not consider anybody but a fully-qualified engineer for their gasolene-engined yacht, or any other than licensed engineers on their full-powered craft, think a "square-head" deck-hand well capable of attending to the same oil engine immediately it is installed in an auxiliary. Such is a great mistake, and an engine (up to 25-h.p. it is not so important) deserves the knowledge and care of an engineer, or a man with a knowledge of internal-combustion engines, no matter where installed. One American concern of oil engine builders will not sell an engine for an auxiliary unless a capable engineer is to be in charge. Few persons would engage a chauffeur for their car unless he was a good mechanic with some shop experience, yet the modern automobile engine is considered remarkably reliable, so the above cannot reflect upon the reliability of the marine oil engine. Therefore, the most sound policy is to put good men in charge—the difference is only a few dollars a week, and hesitation in this respect is not good business.

The ship's officers can to a great extent assist in the successful operation of an auxiliary trader and quite a little is dependent upon them doing their best. In many cases bonuses are offered to captains for making a quick voyage, which may tend to tempt an unscrupulous man to use the power plant at such times when sails exclusively could be used without much loss in speed. A check can be placed on such tendencies by giving a bonus to the chief engineers for the economy of fuel and lubricating oil, and for the avoidance of mishaps; although these opposite factors may cause danger of internal friction, due to the engineers not wanting to run the engines when the captains believe it necessary. This, of course, is purely a personal element, as it rests with the individuality of the men concerned. As the captain's decision is absolute, the apparent difficulty can easily be overcome, particularly if he instead receives a bonus on the annual profit.

Let us probe a little more deeply into the advantages of auxiliary power. First, take a seagoing sailing ship of fair size, trading, say, between Bermuda and Norfolk, Va., because this route offers advantages and disadvantages to both auxiliaries and sailing ships respectively. Every commercial sailing ship without self-power propulsion will frequently require the services of a tug, and while being towed is incidentally paying the tug owner's profit, wages of the tug's crew, and the running costs and up-keep of the latter. Now this expense has to be added to the current running costs of the sailing ship, the same being represented by the towing fee. The question of pilots' fees depends upon the harbor and size of ship.

A ship owner recently gave THE RUDDER some interesting figures of a barque of 850 tons net and 1,300 tons deadweight capacity trading between the above ports. A single slow-running oil engine of about 300-b.h.p. (400-i.h.p.) would give such a ship a loaded speed of 7 to 8 miles an hour, and the entire plant, including engine room auxiliaries, propeller shafting, and work of installing, would come to from $18,000 to $23,000 in normal times. (Today's prices would cost about $30,000.) Whether it would be advisable to reduce this first cost by installing a lower power will depend upon the lines of the hull and if the ship is easy to drive.



Margaret Haskell, Foundered Off Hole-in-the-Wall Passage, Bahama Islands, in February, 1916. Capt. Loesch and Crew Saved in 26-Foot Power Yawl, Equipped With a 10-H.P. Heavy-Duty Sterling Engine

To make her a full-powered ship and thus dispense with sails, she would require 500-b.h.p. (600-i.h.p.), and this should give her 8 knots (9¼ m.p.h.) loaded and 9 knots light, either with twin or single-screw, the latter being the more economical arrangement, if a reliable engine is selected. The cost of a single-screw installation of the latter power would be between $35,000 and $40,000, as the auxiliaries would have to be more complete. Hence, with the same hull we get the following results:

Sail (Barque).—850 tons net; 1,300 tons D. W. C.; power, nil. Crew: Captain, mate, second mate, bos'un, steward, 9 seamen—total 14 men.

Auxiliary (Barque).—850 tons net; 1,250 tons D. W. C.; power, 300-b.h.p. Crew: Captain, mate, second mate, bos'un, engineer, assistant engineer, steward, 9 seamen—total 16 men.

Full-Powered.—850 tons net; 1,200 tons D. W. C.; power, 500-b.h.p. Crew: Captain, mate, second mate, chief engineer, two assistant engineers, oiler, steward, 4 seamen—total 12 men.

It should be pointed out that, while the auxiliary requires two extra men because of the addition of the engines, the expense of indirectly paying the wages of the tug's crew is deleted. A schooner would only require half the above number of deck-hands. The cost of towing in and out of Bermuda is 12 cents per ton N. R. respectively, or $156. Sometimes a sailing ship can sail in and out of Norfolk, Va., without a tug, so it is only fair to half the charges in this instance, so that for a return voyage from Bermuda the towing bill will be $234. But this is a small part of the saving. The record for a sailing ship for one voyage is five days, while a full-powered vessel would make the 800 miles in four days, and an auxiliary in six to seven days. Sailing ships often take as long as fourteen days, and have been known to occupy twenty-five days, but the latter is exceptional.

However, it is reasonable to give eleven days as the average time of a sailing ship, so that an auxiliary will make five one-way voyages to the sailing ship's three, and because of her better speed will obtain slightly better prices on her cargo, but the latter depends upon the nature of the freight.

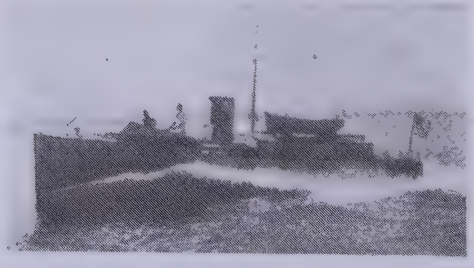
As the freight rates are about $2.25 per ton, it means that the sailing ship carrying 1,300 tons per voyage will earn $8,775 in two months (three voyages), compared with $14,062 for the auxiliary carrying 1,250 tons (a difference of $5,287) the remainder of the time in each case being spent in port. Adding the saving effected to the towing charges saved ($546) we get a total of $5,833 in two months, or $34,998 per annum, from which to deduct interest on the first cost, fuel and lubricating oil, depreciation, repairs, and the wages and food of the two engineers. The fuel and lubrication oil bills would amount to a total of about $1,197 and $750 respectively for the year. For this we assume the normal price of a light residual fuel-oil to be 3 cents per gallon (42 gallons = 1 barrel; 7 barrels = 1 ton). Lubricating oil at 3 gallons per day. For these calculations a total of 70 running hours per voyage at full power, or 2,100 hours per year, was assumed.

Hence, it will be realized that on this particular service the auxiliary power-driven sailing ship should be a very paying proposition. Whether a further economy can be obtained by making such a craft a full-powered ship can best be estimated by the owner himself from the figures given. Even if a further economy can be obtained, it only emphasizes the enormous value of the marine engine to the sailing ship owner.

These statements were submitted to another well-known firm of ship owners, whose deductions are of interest: Their first query was: "How many wooden U. S. sailing craft of over 1,000 tons d.w. capacity are strong enough to be power-equipped with safety, say 300 to 500-h.p. engines? Would it be good business judgment to go to the expense of at least half-construction costs to equip her with motive power without considerable reconstruction of the hull, and the fitting of ballast tanks, so that navigation is possible when running light? Thirdly, would many underwriters look with favor on old craft, with engines, for general North Atlantic trading, and is it not a fact that not a few of the U. S. fore-and-aft sailers engaged in South American and transatlantic trade within the past eighteen months would be insurable risks if offered at the present time, owing to structural weaknesses? Fourthly, where are there in excess of about a dozen metal-constructed sailers that might safely be fitted with power?"

These ship owners go on to say that "it would be best to properly build power ships of not less than 9 knots speed, and of 1,500-3,000 and upwards cargo capacity under and upon deck, exclusive of fuel storage for sixty days, if they happened to be intended for other than U. S. Atlantic coastwise trade. At the present time, and following, there is and will be but little call for special service routes, or for special cargoes."

(To be Continued)



Lynx, 46-Foot Twin-Screw Speed Cruiser, Owned by Nathaniel Ayer, Jr. Designed by Swasey; Built by Lawley. Equipped With Two 6-Cyl. Sterling Engines. Speed 24.5 Miles



Tillie A. II, 62-Foot Cruiser, Owned by Anton Ahlers. Designed by J. Murray Watts and Equipped With a 6-Cyl., 60-70-H.P. Heavy-Duty Sterling Engine. Speed 12 Miles

Designs

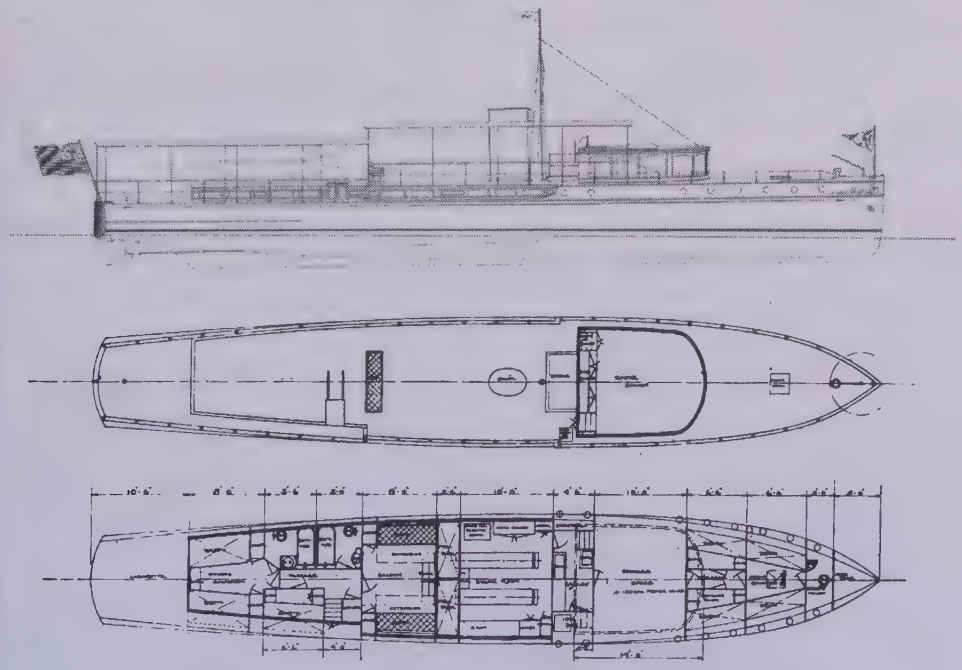
85-Foot Speed Cruiser

A PLAN of an 85-foot by 14-foot speed cruiser is shown herewith, from the New York Yacht, Launch & Engine Company, Morris Heights, New York City, who have tried in this plan to show a boat which will be a compromise between the high-speed scout cruiser and the heavy cruiser.

This boat is to be built with light substantial construction, and will have a speed of 20 miles per hour. The accommodations for crew are forward, to consist of two staterooms and forecastle. The engine room is amidship, with gasolene tanks aft of engine. The owner's quarters consist of saloon, a double stateroom, a single stateroom and two bathrooms, and the dining saloon is in the deckhouse with galley aft as shown in the plan.

The deck of this boat will be one of its features. The interior is to be finished with panels raised, and the outside of cabin is to be of teak. The boat will be complete with small boats and full cruising outfit. The general dimensions are:

Length	85 feet 0 inches
Breadth	14 " 0 "
Draught	3 " 6 "

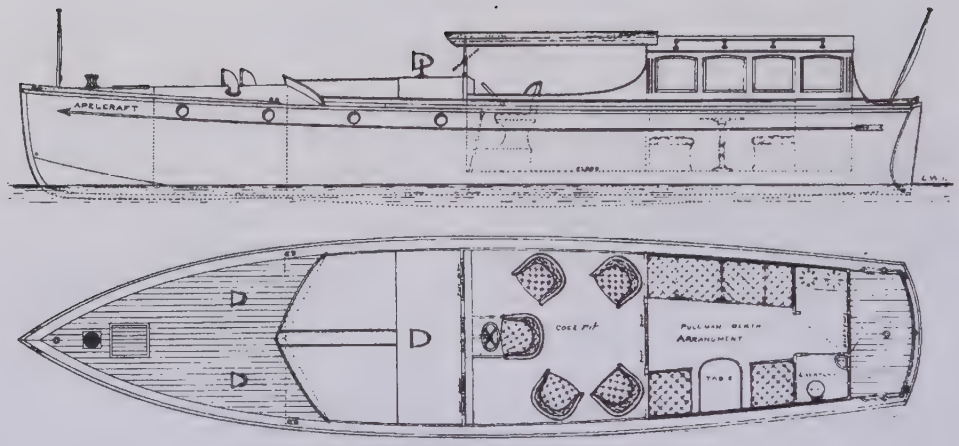


85-Foot High-Speed Cruiser. Designed and Built by the New York Yacht, Launch & Engine Company

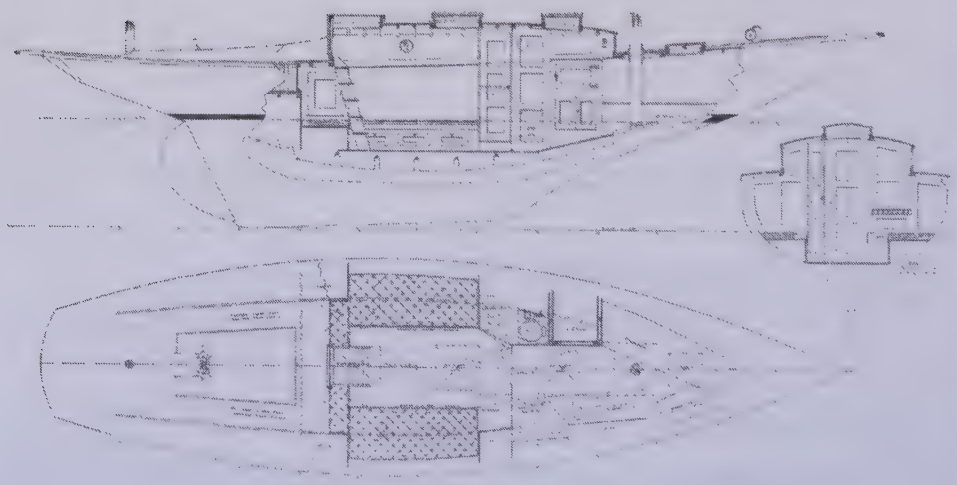
40-Foot Limousine Cruiser

A limousine express cruiser which will make 40 miles an hour has been designed by Adolph E. Apel and built by the Ventnor Boat Works, and the plans show a most attractive boat with many novel innovations. The shape and construction of the bottom is patented and is the original wave-collecting, monoplane type with the V-shaped bow, which, it is asserted, makes the boat seaworthy, dry and comfortable.

The yacht is constructed of white oak and white cedar for hull and African mahogany for stern, transom, cabin and all trimmings. At the bow there is a chain locker in



40-Foot Limousine. Designed by Adolph Apel. Built by Ventnor Boat Works



Accommodation Plan. 27-Foot W. L. Cruising Yawl. Designed by B. B. Crowninshield

which is a fresh-water tank and 5 feet aft of the bow is a watertight bulkhead. The crew's quarters occupy 8 feet of space fore-and-aft, and then comes the engine space, 7 feet. Then there is a cockpit 8 feet long and this is followed by the cabin, 8 feet, which is fitted with Pullman berths.

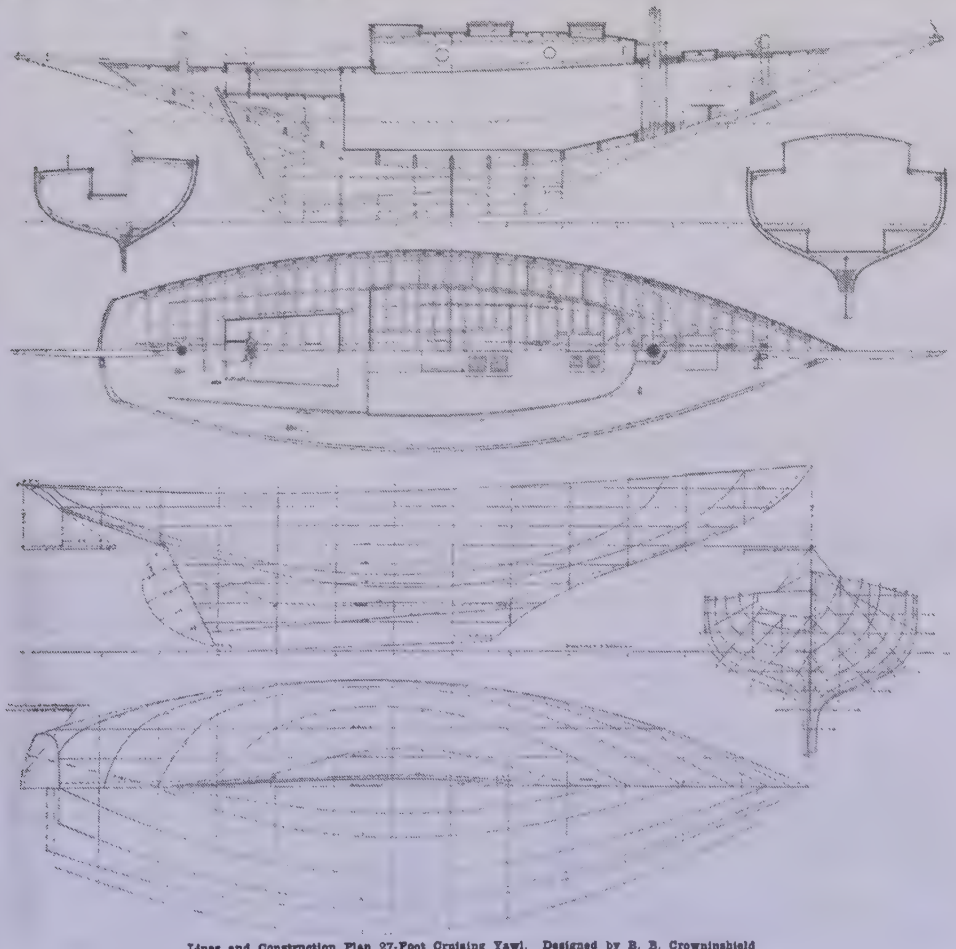
All the engine controls, levers, gauges, revolution indicator's clock, fire extinguisher, searchlight controls, steering controls, etc., are on the bulkhead in front of the cockpit. There are also double doors in the middle of this bulkhead which lead through a companionway between the engines to the crew's quarters forward.

Four gasolene tanks are installed, one on each side above the engines for gravity feed and two large ones under the cockpit floor, which charge the smaller tanks above by a mechanically-driven circulating pressure pump, the overflow running back to the main tank. The total cost of this boat, which varies according to the power installed and the speed guaranteed, is from $7,500 to $9,500.

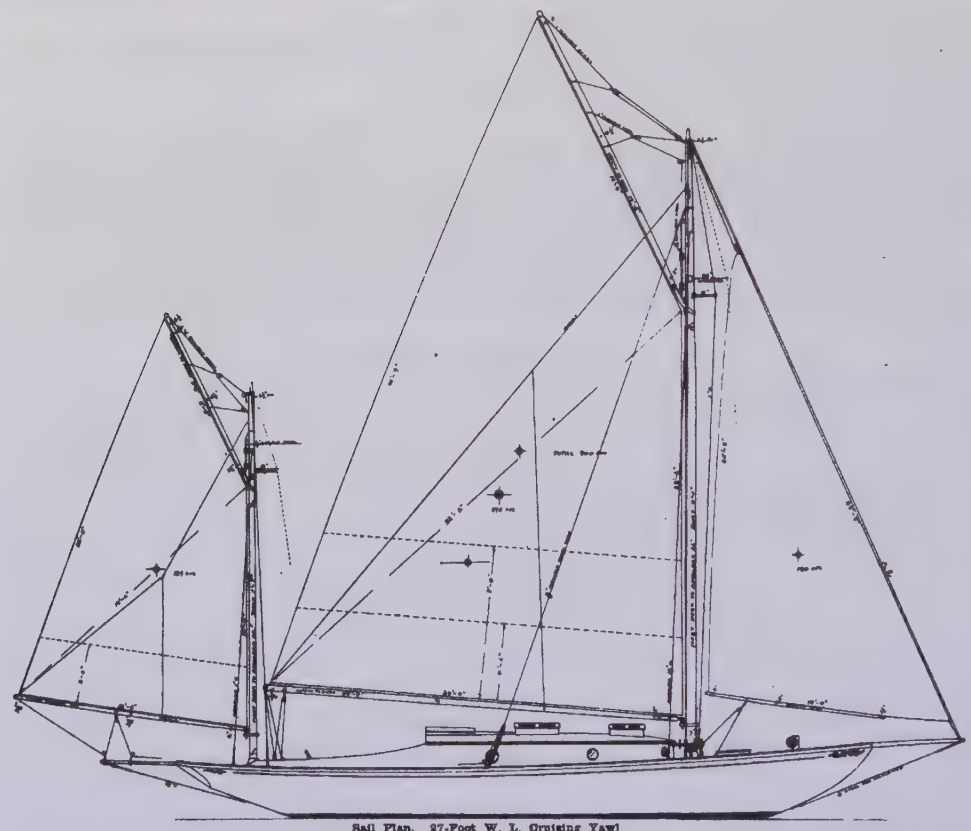
27-Foot Cruising Yawl

A 27-foot water-line cruising yawl has been designed by B. B. Crowninshield for a well-known yachtsman, plans of which are printed herewith. The model shows a powerful, high-sided boat which will be able to go out in rough water. The interior accommodations are very good for a yacht of this size and the headroom in the cabin under the beams is 6 feet 2 inches.

Forward there is a gas-pipe berth for one man, aft of which is the galley, fitted with a stove, sink, dish-racks



Lines and Construction Plan 27-Foot Cruising Yawl. Designed by B. B. Crowninshield



Sail Plan. 27-Foot W. L. Cruising Yawl

and ice-box. On the port side is a toilet, and the cabin aft again is fitted with two transom berths. A companionway from the cabin leads to the cockpit and deck.

The general dimensions are:

Length o. a.	40 feet 6 inches
Length l. w. l.	27 " 0 "
Breadth	11 " 0 "
Draught	5 " 6 "
Sail area	944 square feet
Iron keel	5,500 lb

39-Foot Single-Handed Schooner

A single-handed schooner has been designed by William J. Deed, Jr., of Boston, Mass., for a yachtsman of Massachusetts Bay, which is intended for comfortable afternoon sailing and week-end cruises on the bay, with everything led handy to the wheel, so that one person can sail her.

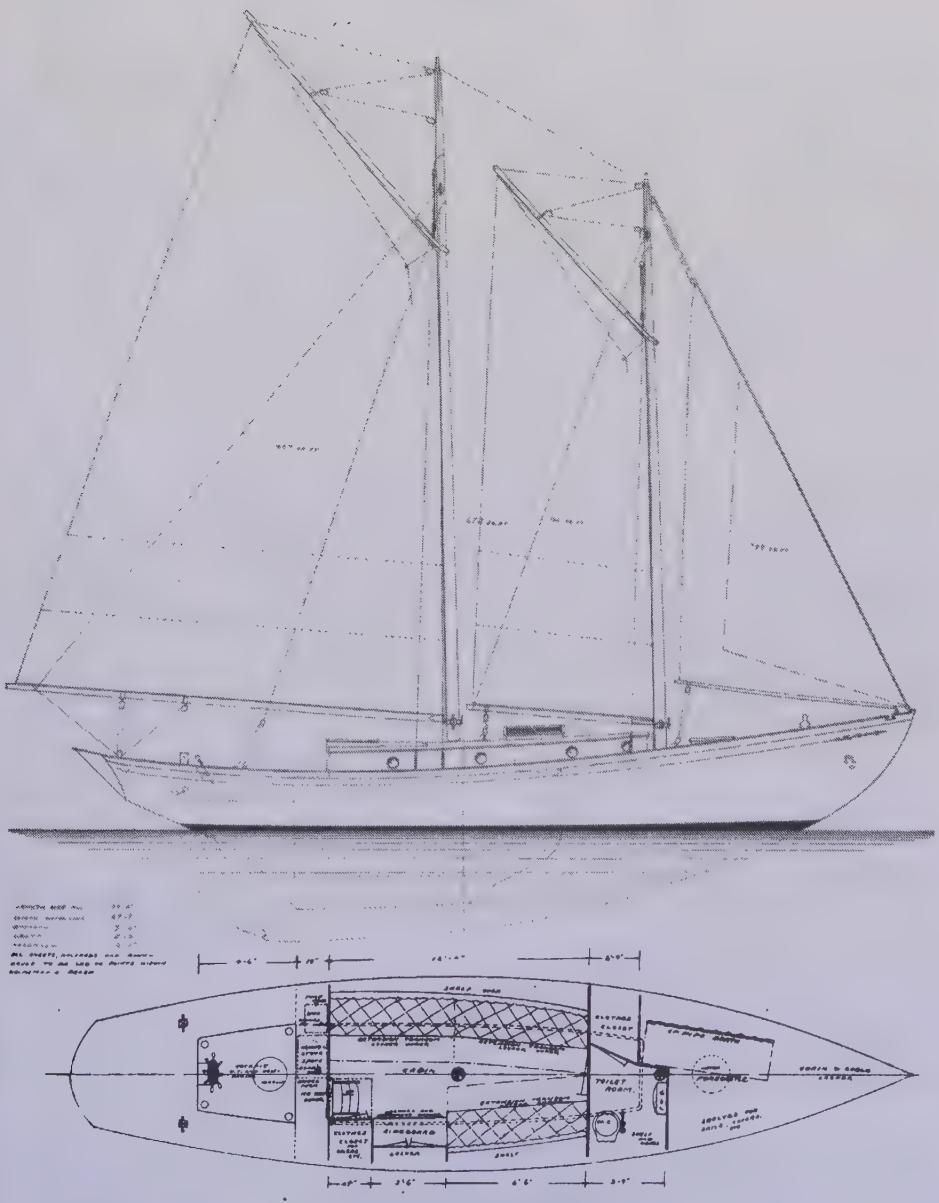
It has full headroom below in a very good-sized cabin arranged to accommodate a party on three double-width berths formed by extension transoms.

The dimensions of the quarters are shown on the plans. The galley is intended only for emergency, but is really a good working feature, consisting of alcohol stove, ice-box, sink, dresser and dish lockers. Under the bridge deck as it is, it takes up little room, intruding itself little into the cabin, and may be forgotten when day sailing. The cabin is really large for the size of the boat. The cockpit is large enough for day sailing and not so large as to hold much water in rough-weather cruising.

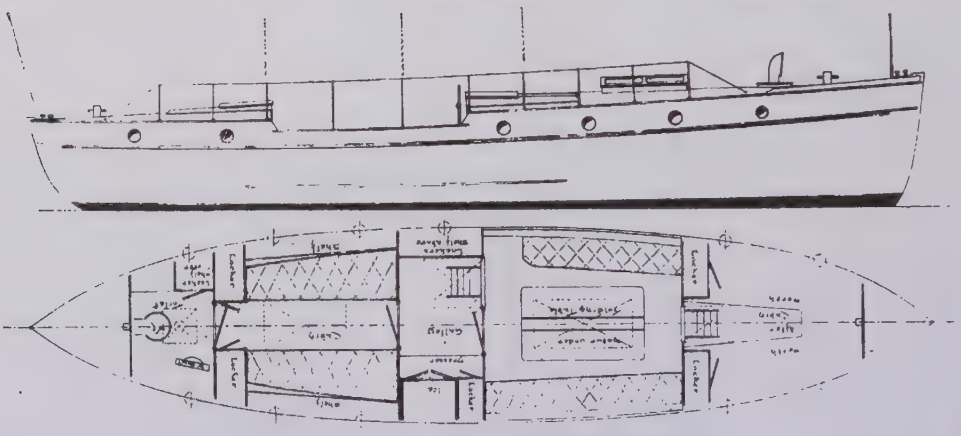
The sails are all inboard and the plan is a handy one. The lines of the hull indicate a very healthy type, which it would do well for yacht clubs to study with a view to making one-design classes of such a boat as this, as she has accommodation and seaworthiness beyond the average one-design class boat of her size. Free of fancy construction and plain in design and fittings as she is, she would be a very reasonable boat in cost.

The general dimensions are:

Length o. a.	39 feet 0 inches
Length l. w. l.	27 " 9 "
Breadth	9 " 3 "
Draught	5 " 3 "
Sail area	672 square feet



30-Foot Cruising Schooner. Designed by William J. Deed, Jr.



37½-Foot Seagoing Cruiser. Designed by Elliot N. Burwell

37½-Foot Seagoing Cruiser

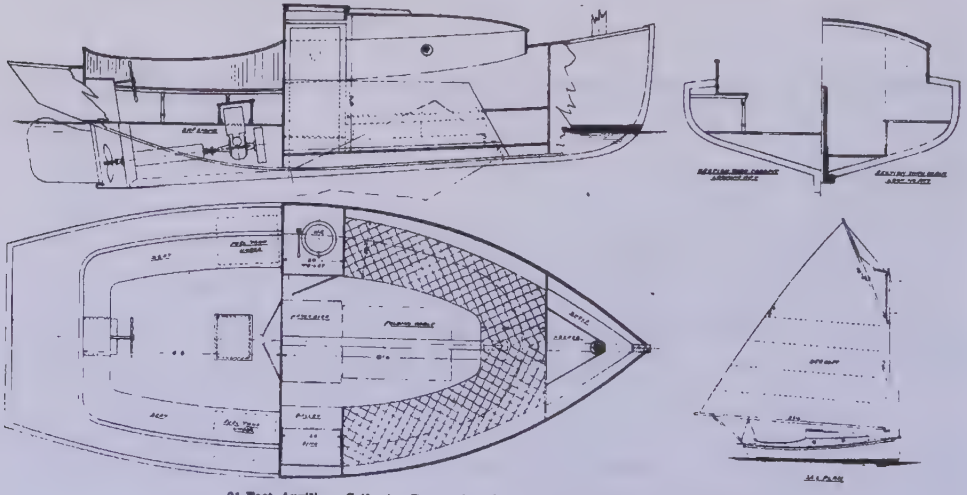
A very attractive salt-water cruiser has been designed by E. N. Burwell, the plans of which are published herewith. The cabin has been laid out to give much comfort to the owner and crew of three. One feature of the arrangement is the position of the engine, which is to be installed in the cockpit space between watertight bulkheads. This pit will also contain the gasolene, oil and fresh-water tanks, and the only pipes to pierce the bulkheads will be the water pipes to the galley, which will be bushed and a gland installed to make it absolutely watertight. The propeller will go through a special casting with a gland to make it tight.

The galley, main cabin and toilet are to be finished in black cypress and white enamel. The boat will be equipped with electric lights, oil lamps, a full nautical outfit and be a most complete little cruiser.

The cockpit will be watertight and be a fine place for sleeping, being equipped with a folding camp bed, khaki curtains and mosquito screens. This yacht fitted with a 45-h.p. engine will make 12 miles an hour.

The general dimensions are:

Length o. a.	37 feet 6 inches
Length l. w. l.	33 " 0 "
Breadth	8 " 0 "
Draught	3 " 0 "



31-Foot Auxiliary Catboat. Designed and Built by the Toppan Boat Company

21-Foot Auxiliary Catboat

The Cape cat is just as popular with certain yachtsmen as it was years ago, but with the growing demand for power it has been found advantageous to install small engines in this type of yacht and make it an auxiliary. The Toppan Boat Manufacturing Company are building as a stock boat a 21-foot auxiliary catboat, which model is similar to their 24-footer. The new model, plans of which are given herewith, has a breadth of 9 feet and carries 354 square feet of canvas on 14 feet hoist and with a gaff 14 feet long and a boom of 23 feet 6 inches.

The cabin is fitted with transoms on each side and across the forward end. It is 8 feet 6 inches long and has a folding table arranged on the centerboard trunk. At the after end there is a toilet on the port side and a galley on the starboard side. The cockpit is 6 feet 6 inches long and the engine is installed under the cockpit floor and is reached through a hatch.

Larchmont Y. C. Class O Sloops

Six sloops have been ordered by members of the Larchmont Y. C. and two other members are contemplating building. It is possible that when the season opens ten yachts of this class (Class O) will be at the starting line. The plans have been drawn by William Gardner and the yachts in model are very much like Medora, one of the most attractive and successful yachts of the many built from Gardner plans. Edmund Fish has been very active in getting the members of the club to form this class and he will be just as active in sailing one of the new yachts. The owners of the six already ordered are: Commodore James B. Ford, H. H. Raymond, Dr. James Bishop, J. F. Feder, A. Bryan Alley, and W. R. Timken.

Work was started some time ago at Wood & McClure's yard at City Island, and those builders have promised to have a fleet of twelve ready in time, if the orders are placed early. That the new yachts will be well built is assured, because Wood & McClure always do things well.

The plans printed herewith show what complete cruisers the new yachts will be. There is a narrow cockpit 2 feet 6 inches wide by 7 feet long. The deck is carried right into the sides of the cockpit, forming a seat. The coaming is sprung around on the top of the deck, leaving a seat 18 inches wide. Forward of the cockpit is a trunk over a stateroom. This is 4 feet fore-and-aft and 4 feet 6 inches wide. A bridge deck 12 inches wide separates the after trunk from the main cabin trunk, which is 11 feet 9 inches long, 5 feet wide at the after end and 4 feet 8 inches wide at the forward end. Forward of the mast is a square hatch, giving access to the forecastle, the windlass, ventilator, mooring cleat, etc.

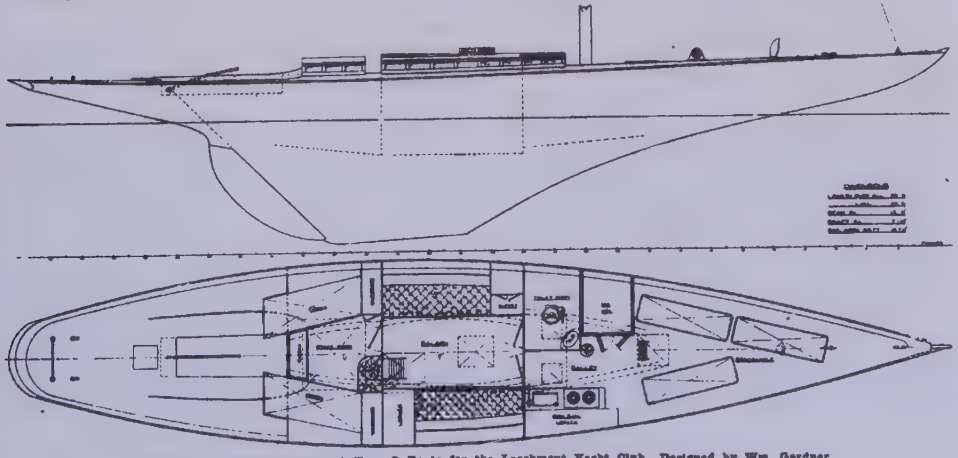
A companionway is on the starboard side of the main cabin trunk leading directly into the saloon, which contains a large locker, buffet, two transom berths 6 feet 8 inches long, over which are shelves.

A door under the bridge deck on the port side leads into the stateroom aft. In this stateroom are two berths 6 feet 3 inches long, which extend partly under the deck on either side of the cockpit. There is also a large bureau at the after end between the berths and at the forward end are two wardrobes, and on the starboard side is a seat under which is a yacht toilet and over it a folding wash-basin. Forward of the saloon is a large galley on the starboard side and a toilet on the port side. A large ice-box is forward of the toilet and in the forecastle are three pipe berths.

One of the fleet is to be fitted with a Marconi rig. Just which owner will have that rig has not yet been determined, but that yacht will be tried out for the entire season against the others, which will have the regulation gaff mainsails, and in this way the merits of the Marconi rig will be thoroughly tested.

The yachts are to be built with oak frames and mahogany planking. They will cost about $10,000 each. Their general dimensions are:

Length o. a.	59 feet 9 inches
Length l. w. l.	38 " 6 "
Breadth	12 " 0 "
Draught	7 " 10 "
Sail area	1,670 square feet



Profile and Arrangement Plan of Class O Boats for the Larchmont Yacht Club. Designed by Wm. Gardner

Challenge Cup for Model Yachts

MODEL yacht building and racing will receive a big impetus this year through the action of an enthusiast who has offered through the Yankee Model Y. C. a challenge trophy to be raced for by yachts built to rate under the International Rule. It is to be known as the International Cup. The races are to be sailed on Prospect Park Lake next June, and unless there are six entries, there will be no race.

The object of this prize is to encourage the building and designing of a useful type of yacht and to develop models from which full-sized vessels may be built. The Rudder Publishing Company has been asked to act as custodian of this trophy, and has consented to act. The announcement of the Yankee Model Y. C., and the conditions to govern the cup, measurement rule, etc., follow:

The Yankee Model Yacht Club takes pleasure in announcing the Gift in trust, on conditions hereafter outlined, of a trophy to be known as The International Cup, for model yachts measuring under the International Rule with the 12-rater class, to be raced for without handicap over a triangular course on Prospect Park Lake commencing June 9th and 10th, 1917, and continuing, if necessary, on subsequent week ends.

1. The Rule

The International Rule of measurement for rating yachts was accepted by the leading yacht clubs of Europe in an endeavor to encourage a type of yacht useful, not only as a racing craft, but one commodious, habitable and seaworthy enough for practical use as a pleasure craft as well.

This same rule has been adopted by model yachtsmen as well, especially in England, because it was found to afford a rating in linear units either of feet or meters, to which a successful sailing model can be built on the same lines of a full-sized yacht, or vice versa, according as the scale is one inch to the foot or the reverse, and in consequence the sport of model yachting has come, in England at least, to be regarded as an instructive and important experimental adjunct to the science of yacht design.

2. Purpose in Selecting the Rule

The chief purpose of the donor is to encourage in the major field of yachting generally, a type of racing yacht, not only useful as such, but able, commodious and seaworthy enough for general pleasure use as well.

It is hoped that through the inducement offered to the development of a successful class of models under this rule, from which full-sized vessels may be built on exact lines to scale, not only to give new impetus to the major sport, which is manifestly losing ground, by demonstrating through the instrumentality of the models, the feasibility of combining in one vessel the elements essential to a successful racing craft and those of habitability and seaworthiness, but also at the same time, by interesting in the minor sport of model yachting the sons of present-day corinthians, to assure to the major sport an intelligent and enthusiastic new generation of yachtsmen.

The immediate purpose, however, which it is hoped the offer of this cup will in a measure accomplish, is the construction in this country of models on lines, and of a class from which at some future time may be chosen a challenger capable of, and eligible to, meet models produced under this rule abroad, especially in England, where the sport has gained so much ascendance on scientific and instructive lines.

3. The Rule Explained

No yacht measuring to a rating in excess of 3940. by even .01 of an inch will be accepted by the official measurer, accordingly careful study of the formula which follows is essential:

International Rule=

$$\frac{L + B + \frac{1}{2}G + 3d + \frac{1}{3}\sqrt{S.A.} - F}{2} = \text{Rating}$$

An explanation of the elements and their measurement composing the formula are here given in detail as a guide to those intending to build a yacht for the first race:

"L"—length on the loadwater-line with bow and stern tax and overhangs added.

The Bow Tax—the girth of the section at the forward end of the actual water-line less twice the freeboard at that point.

The Stern Tax—Girth of the section at the after end of the actual water-line less twice the freeboard at that point, all divided by 5.

"B"—Greatest breadth of hull wherever found.

"G"—Girth from deck top to deck top on opposite side measured at the girth station less twice the freeboard at that point.

The Girth Station—(i. e., the point at which the foregoing measurement is taken), if the underside is straight, may be placed at any point not forward of .55 from the forward end of the loadwater-line, provided the girth behind .55 does not exceed by more than 3% of the girth at .55.

"D"—The skin girth means the chain girth taken at the girth station.

"F"—The mean or average freeboard measured at bow and stern end of loadwater-line and at .55 from the bow.

"S. A."—Sail area which must be measured as follows:

Mainsail and Topsail—actual areas, i. e., base; the fore triangle A. B. C. is all taxed whether filled in sail area or not. Spinnaker—; b used must not hoist above B nor set outboard a distance greater than A. C.

For guidance of builders the approximate measurements in inches of the English built challenger for this cup are here given L. 40.70; bow tax 2.26; stern tax .92. (B) 12.75; ½G 8.73; 3d .90; $\frac{1}{3}\sqrt{S.A.}$ 15.37; F 2.83—giving under the rule a rating placing this yacht at the top of her class with a sail area of 2,125 square inches.

4. Conditions

Unless on the 31st day of May, 1917, there shall have been measured, accepted and entered for the race at least six yachts measuring under the rule within a rating of 39.40 no cup will be offered.

The Rudder Publishing Company, of 254 W. 34th Street, New York City, will be the trustee and custodian of this trophy and the official measurer for the first race in 1917 will be Mr. Francis S. Sweisguth, naval architect and designer, with William Gardner & Co., naval architects, No. 1 Broadway, New York City.

5. Regatta Committee

The trustee shall receive nominations for, and shall annually appoint a regatta committee of three members, none of whom shall have any interest in any yacht entered, all in accordance with the terms of deed of gift as follows:

For the first annual race, one member from the Yankee Model Yacht Club, one from the Brooklyn Model Yacht Club and one from the Columbia Model Yacht Club, of Baretto Point.

Should any of these clubs fail before May 1, 1917, to nominate in writing to the trustee a member for this committee, the trustee and the individual or individuals nominated, or the trustee above, if none shall be so nominated, shall choose a disinterested person or persons capable of intelligently serving on this committee, as the case may require.

In each year after the first annual race the Yankee Model Yacht Club, the winner of said race, and the owner of the yacht awarded second place therein shall each be entitled to nominate one member of the regatta committee for the ensuing year, otherwise the committee to be chosen as above so far as possible to give representation therein to the Model Yacht Club represented upon the regatta committee of the first race.

6. Duties of Regatta Committee

The regatta committee shall have complete charge of the conduct of the races and shall not delegate any of the duties imposed by the deed of gift except in the matters of touch counting, placement of race buoys and policing of the course. The committee shall see to the entry of the results of each annual race in a race record book to be kept by the trustee for that purpose in accordance with the terms of the deed and shall certify in writing to the trustee within one week after the race the name of the winner and second yacht with owners' names and points won by each.

7. Custody and Ownership of Cup

The winner, within the year from the date of the first race, of three sequential and successive races or legs upon the cup shall be awarded possession and deeded by the trustee full and complete ownership thereof. Otherwise the cup shall revert to the donor.

Each winner of an annual race shall be entitled to have the yachts and his name engraved upon a suitable part of the trophy, upon a cash deposit of one-third in excess of the cost price thereof to receive the same temporarily for a time not to exceed three months from the custody of the trustee, and also within the conditions of the deed of gift to name any home waters within a radius of five hundred miles of New York City for the holding of next annual race for the cup. All defenders of this trophy shall race through as in the first race, using the same or a new yacht, but only one.

8. Races

The annual races shall be over courses similar to the course laid out for the first race, which shall be triangular, providing a run, reach and beat to windward. Entries will be divided into classes of not over four yachts to each class. Each class shall have three elimination races on separate days. Awards thereon to be on a point basis described in the deed of gift, and the successful vessels as defined in the deed of gift to race in the sail-off or final races which shall likewise consist of three races, except as otherwise provided in the deed of gift. All boats will be sailed twice around the course. The placement of entrance in the elimination races will accommodate as far as possible their entering more than one yacht.

9. Sailing Rules

Sailing rules in accordance with the deed of gift and practically in accord with things more stringent than those now in general use in the sport will be furnished at the time of entry and measurement of yachts in May, 1917.

10. Entries

The races are to be open to anyone whose yacht complies with and is within the rule in the judgment of measurer and is required by the deed of gift. No entrance fee will be charged. Not more than three yachts shall be entered by any individual.

All yachts, especially those of New York and Long Island clubs, are earnestly urged to enter this sport in the encouragement of their junior members to an intelligent interest in the major sport and entries from each are particularly encouraged. Model Yacht Clubs, Country Clubs, Marine and Field Clubs, and all yacht designers and concerns interested in yacht designing, marine and Navigation Schools, Seamen's Associations, and all persons interested in model yachting are invited to build and enter these races.

That the committee may have some guide in making plans, immediate advice of intended entries is asked.

Formal entries should be in writing, addressed to the undersigned and should state owner's name and address and club, if any, name of yacht, and probable measurements thereof, under the above rule.

No entry will be received after May 31, 1917, and all yachts should be submitted for measurement at the boathouse of the club on Prospect Park Lake, Brooklyn, N. Y., as near May 1st as possible. No yacht can be measured or entered if submitted after May 31, 1917.

Respectfully,

Yankee Model Yacht Club,
By George Mould.

Address entries to the chairman, at 540 4th Street, Brooklyn, N. Y. (Chairman, Committee International Cup Race, 1917).

Note.—Percival Marshall's "Model Sailing Yachts" will be found helpful to builders under this rule, and can be had at Rudder Publishing Company, 254 West 34th Street, New York.

Happenings in the Yacht Clubs

New York Y. C.

THE last general meeting of the year of the New York Y. C. was held in the clubhouse on December 21st. The ticket prepared by the nominating committee was submitted to the members and elected. There are few changes made and the officers and standing committees are: Commodore, George F. Baker, Jr.; vice-commodore, J. P. Morgan; rear-commodore, H. S. Vanderbilt; secretary, G. A. Cormack; treasurer, Tarrant Putnam.

Membership Committee: W. Butler Duncan, chairman, Henry A. Bishop, Harold S. Vanderbilt, Commander F. L. Sawyer, U. S. N., Leonard Richards, Charles Lane Poor.

Race Committee: H. de Berkeley Parsons, chairman, Joseph M. Macdonough, Frederic O. Speddon.

Measurer, Harold W. Webb.

House Committee: Samuel A. Brown, chairman, Charles M. Billings, Henry T. Maury.

Library Committee: James D. Sparkman, chairman, Charles W. Lee, Henry B. Kane.

Model Committee: Frederick M. Hoyt, chairman, Henry N. Fletcher, George Nichols.

Committee on Club Stations, the flag officers ex-officio: J. P. Morgan, Morton F. Plant, Arthur Curtiss James, Robert W. Emmons 2d, J. Harvey Ladew, Walther Luttgen.

The report of the Race Committee showed that the season had been one of the most successful in many years. The report said: "During the season the committee started races on fourteen different days. The number of yachts started was 325, which does not include a duplicate entry of a yacht starting in different events on the same day. There were 96 races sailed. All time allowances have been calculated from 100 feet rating measurement. By this method the corrected times of yachts are comparable irrespective of size.

"Challenges were received from Elena for the Cape May Challenge Cup and for the Brenton Reef Cup. There were no entries for the Niagara IV Cup.

"The Committee acknowledge their obligation to Commodore Baker for the use of the yacht Viking, to Vice-Commodore Morgan for yacht Corsair, to Captain J. M. Macdonough for yacht Virginia, and to Captain Wilson Marshall for yacht Ansantawae.

"The Committee extend their thanks to the flag officers for the cups presented by them and for their courtesy and assistance."

The financial statement showed that the original appropriation was $7,500. The expenditures of the committee were $3,330, leaving a balance available for prizes of $4,170. The estimated value of the prizes donated by the members was $6,000, making a total of $10,170 and the King's Cup.

The report of the race committee was published as usual in pamphlet form and gave a complete account of every race sailed.

The flag officers are now serving their third terms of office, having been first elected in 1915. Secretary Cormack first took office in 1902, and this makes the sixteenth year of his service. Mr. Putnam, the treasurer, has held that office since 1901.

Larchmont Y. C.

The annual meeting of the Larchmont Y. C. was held in the Waldorf-Astoria on November 6th. The officers and committees in the reports submitted to the members showed that the club is on a very solid foundation and is

better off than it ever was. The report of Samuel J. Bell, the retiring treasurer, was particularly gratifying to all who have the interest of the club at heart. Howell C. Perrin, chairman of the regatta committee, in his report showed that the racing season had been very successful. The prizes which had been won during the Summer were on exhibition, as was a model of the new O Class of sloops which members of the club will race next Summer. Among those who presented prizes for last season's racing were: Commodore James B. Ford, Vice-Commodore John Proctor Clarke, Rear-Commodore Henry D. Whiton, George F. Baker, Jr., J. P. Morgan, H. L. Maxwell, Wilson Marshall, R. J. Schaefer, George W. Plumb, George M. Pynchon, George W. Scott, W. B. Jenkins, C. Andrade, Jr., and Ralph N. Ellis.

The officers elected were: Commodore, James B. Ford; vice-commodore, John Proctor Clarke; rear-commodore, Henry D. Whiton; secretary, Frank A. Moore; treasurer, Albert J. Morgan; trustees for Class 1919: Edmund Fish and William J. Moran.

Nominating Committee, 1917: William B. Jenkins, Thomas J. McCahill, Charles L. Cammann, Jr., Butler Whiting, T. J. S. Flint, Rev. Richard Cobden, Herbert H. Childs, Hunter Wykes, E. Pierpont Hicks and Howell C. Perrin.

Indian Harbor Arrows

The Arrow Class of the Indian Harbor Y. C. kept on racing until November; altogether 27 races were sailed from July 23d to the end of the season. Eight of these sloops were built from designs by J. G. Alden, and they have proved so attractive that more are to be built during the Winter. Races were sailed on Saturdays and Sundays, and in addition to the races series prizes were competed for, all the Saturdays in each month forming one series and all the Sundays another. Consequently seven series races were sailed.

Rani, owned and sailed by Vice-Commodore Clifford D. Mallory, was the most successful yacht. In all Rani won 24 prizes, 5 firsts and 1 second in the series and 17 firsts and 1 second in the separate races, giving her a total of 22 firsts and 2 seconds. Jack-o'-Lantern, owned by Rear-Commodore L. H. Dyer, was second with 16 prizes. That yacht won 2 firsts and 3 seconds in the series races and 1 first and 10 seconds in the separate races, making a total of 3 firsts and 13 seconds. In the series races, J. D. Chapman's Snapper, R. T. Bailey's Bubble, and R. E. Slaven's Hawk each won a second prize. The other winners in the separate races were: Hawk, R. E. Slaven, and Snapper, J. D. Chapman, 3 firsts and 5 seconds; Bubble, R. T. Bailey, 2 firsts and 1 second; Pep, Commodore W. H. Childs, 1 first and 2 seconds; Rascal IV, S. C. Hopkins, 2 seconds, and Comrade, A. G. Hanan, 1 second.

Squantum Y. C. Winners

A series of open races by the Squantum Y. C., of Quincy, Mass., were sailed off the clubhouse on Quincy Bay over a six-nautical-mile course, last Summer.

The object of these races was to get the members interested in sailboat racing. The power-boatmen also were looking for a series of races, but were told when they could work out a series of rules and handicaps favorable to all they would have a series of races. They did not make any report, so the matter was dropped.

The races were sailed in accordance with the Y. R. U. of Massachusetts rules and were open to all boats entered in the Union, in their restricted classes.

Almira, owned by Dr. H. A. Jones, won the silver cup offered by Commodore Louis J. Jobins, for Class D; Reina, owned by W. P. Karshick, won a bronze cup offered by Vice-Commodore Frank E. M. South, in Class I; Tern, owned by C. E. Benton, won the ship's clock donated by the regatta and house committees in Class K; J. J., owned by J. J. Farrell, won a compass donated by J. D. McIntyre. Eighteen yachts took part in seven races.

The Merry Mount Cup, a perpetual club trophy, was won by Winnie C, owned by Wm. R. Cole.

New Rochelle Y. C.

The annual meeting of the New Rochelle Y. C. will be held this month. The ticket to be presented by the nominating committee and which will be elected is as follows: Commodore, Charles A. Marsland; vice-commodore, Henry W. Martin; rear-commodore, George P. Granbery; secretary, William J. Winter; treasurer, Henry M. Lloyd; trustees, C. E. Whyard, Francis M. Wilson and Samuel J. Garges; regatta committee, Edwin H. Tucker, Oscar H. Chellborg, and William H. J. Ehler; measurer, Roger M. Haddock.

American Model Y. C.

The 350th meeting of the American Model Y. C. was held December 3d, at which the following officers were elected: Commodore, E. A. Plunkett; vice-commodore, W. F. Coyle; fleet captain, J. C. Collins; secretary, P. M. O'Neil; financial secretary, F. J. Townsend; treasurer, E. H. Wirth; measurer, P. H. Bell; trustees, G. W. Winchell, C. R. Donnell, J. P. Casey.

Chicago M. B. C.

The members of the Chicago M. B. C. have elected the following officers for 1917: Commodore, A. H. Webb; vice-commodore, W. A. Woods; rear-commodore, N. C. M. Jensen; secretary, Leo P. Plantin; treasurer, Gust. Weideman; trustees, W. W. Nugent, P. Kargard, Ralph Esau, G. E. Reid, Oliver Stenstrom.

South Shore P. B. C.

The annual meeting of the South Shore P. B. C. (Chicago) was held recently and the following officers elected: Commodore, E. E. Fies; vice-commodore, R. M. Baker; rear-commodore, C. A. Cahn; secretary, C. C. Fauquier; treasurer, John Swanson; directors, L. J. Flood, E. L. Bauer, George A. Jeffers.

Harlem Y. C.

The members of the Harlem Y. C. have elected these officers for 1917: Commodore, Arthur H. Hall; vice-commodore, Robert S. Haydock; rear-commodore, George W. Young; treasurer, Philip J. Fox; secretary, Edward Schmidt; financial secretary, William T. Hyde; measurer, Fred W. Goeller, Jr.; trustees for two years, Harold W. Kraussman, Philip J. Schneider, Alan Gibson; fleet surgeon, Dr. T. A. Martin.

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART I

WHEN the editor asked me to address THE RUDDER readers he explained that the article must be one for all RUDDER readers, and for all men who desire to learn a little about the fundamental principles of designing boats. As he very tersely expressed it, "Explain power-boat designing in words the average mortal can understand." So I have done my best to carry out his wishes by clearly and briefly explaining the fundamental laws that govern a boat afloat in water, by explaining in non-technical language the calculations that are made by a naval architect when he designs a boat (or vessel) of any kind, and by actually designing a small power boat and explaining the work step by step from the conception of the idea "I will design a boat" down to the final stage of the work, which, by the way, is not, as is generally supposed, when the plans are completed, but is when the boat has been tried out.

Have you ever stopped to consider why a boat (or anything) floats? To this question some will answer (I am quoting from answers that have been given to me many times), because she is too big to sink; others will say because she is not heavy enough to sink, and others again will say because the water cannot get inside; and while all of these answers are in a measure correct, they only partially answer the question. So I will begin by explaining why a boat floats.

1. EXPLAINING WHY A BOAT FLOATS

Two things must be considered when answering this question—*weight* and *bulk*—and the two are equal parts of the one problem. The weight being the actual weight of the boat in tons, pounds, or other weight units; and the bulk being the actual space in cubic feet, or other units of volume, the weight occupies. As it is very important to clearly understand the two terms—weight and bulk—and the bearing each has to the other, I will make use of the following easily understood explanatory illustration:

Suppose there is before you two rectangular blocks in size 1 by 1 by 1 foot (a cubic foot), one being of oak and the other of iron. Weigh the blocks and you will find that the wood one weighs 53 lb and the iron one 448 lb. Therefore, while the bulk of the blocks is similar there is a wide difference in weight, and if you place the blocks in water you will find that the wood one will float with a little over two inches of its bulk out of water while the iron one will sink immediately.

Now let us assume that the metal in the iron block has been rolled into a plate 8 feet long by 8 feet wide and that one foot of its edge, all around, has been turned up to form a watertight trough or box, 6 feet by 6 feet on bottom and having a depth of side of one foot. The weight of metal has not been changed, and if the iron is now placed in water, with the bottom of trough down, you will find that it will not only float, but it will carry 1,802 lb of added weight; the reason being that the cubic foot of iron has been spread over a large surface and its *bulk* (when edges are turned up) increased to 36 feet. Therefore, it is apparent that the problem of flotation is one that calls for consideration of both weight and bulk. The law of flotation is, that anything will float if its weight is *less* than that of an equal bulk of water.

The cubic foot of wood floats because its weight is less than the weight of a cubic foot of water, and the solid block of iron sinks because its weight is greater than the weight of an equal bulk (a cubic foot) of water; and the cubic foot rolled into a plate and formed into a trough floats because the *bulk* of iron when disposed in this shape is increased to such an extent that the weight is *less* than that of an equal bulk (36 cubic feet) of water.

This illustration shows in a striking manner how any known weight can be carried afloat by simply disposing it in such a manner that the space it occupies is greater than the space occupied by a weight of water equal to the known weight.

When a solid is immersed in water it is clear that it *must displace*, or move aside, a quantity of water equal in bulk to itself, because two substances cannot occupy the same place at the same time. The solid takes the place of a volume of water equal to the *bulk* of the solid immersed. You thus can understand that a solid will float, remain suspended, or sink, according as its weight is less, equal to, or greater than that of an equal bulk of water. Therefore, a boat floats because its weight is disposed in such a manner that the space it occupies is greater than the space occupied by a weight of water that is exactly equal to the weight of the boat and all on board. Having thus briefly explained why a boat floats, I will next tell you something about water weight and pressure.

2. WATER WEIGHT, WATER PRESSURE AND BUOYANCY

Water, in common with all substances, possesses weight and this weight must cause pressure upon the sides and bottom of any vessel containing it.

Thus, if we take a watertight box, suspend it clear of the ground and place in it a known weight, the weight will press upon the bottom of box with a force or pressure equal to its weight. Now remove the weight and pour into box an amount of water equal in weight to the weight removed. The pressure on bottom of box will be exactly the same as before, but in addition to this the sides of box will have to sustain an outward pressure. This is clear from the fact that if a hole is bored through side of box water will flow out and the force of outward flow will be in proportion to the distance hole is below the surface of the water. And if this experiment is carried one step further and another hole is bored through bottom of box, it will be found that the force with which water flows through that hole will also be in exact proportion to the depth of water above it. Therefore, we

learn that water pressure increases with depth and is independent of shape, or direction in which the surface it presses upon lies.

Water pressure on the sides or bottom of a vessel containing it can be accurately measured by weighing the water. This being so, it is necessary that you know the weight of water. I give below a table of weights and pressures generally used by naval architects.

DATA SHEET OF WATER WEIGHTS

62.5 lb of fresh water in 1 cubic foot.
64 lb of salt water in 1 cubic foot.
36 cubic feet of fresh water in 1 ton (long ton of 2,240 lb).
35 cubic feet of salt water in 1 ton.

DATA SHEET OF WATER PRESSURE (SALT WATER)

Depth of Water in Feet	Pressure in Pounds per Square Inch	Pressure in Pounds per Square Foot
1	0.44	64
2	0.89	128
3	1.33	192
4	1.78	256
5	2.22	320
6	2.67	384

And so on, advancing 0.44 lb per square inch, or 64 lb per square foot, for each 1 foot increase in depth.

For fresh water the figures are 0.434 lb per square inch, or 62.5 lb per square foot for each foot of depth.

Water pressure is simply another name for water weight. If you refer to the table you will notice that water pressure on one square foot of surface at one foot of depth below the surface is 64 lb (salt), which is exactly the weight of a column of water one square foot and one foot high (a cubic foot). The nature of water pressure is that it is proportional to depth and extent of surface, but alike for all shapes and directions. Water will flow into any vessel into which it is allowed to run and will fit it exactly. But if in the bottom or sides of the vessel it finds a hole it will rush out there with a force exactly proportioned to the size of the hole and depth it is below the surface of the water.

Let us suppose that the box mentioned above is three feet in depth and that three holes are bored through its side, one at each foot of depth, each being exactly one inch in area. To stop water flowing out of the hole at one foot depth a pressure of over 0.44 lb must be exerted against the opening. At two feet the pressure must be increased to over 0.89 lb, and at three feet it must be over 1.35 lb. The pressure of water trying to get out of a vessel which confines it is in no way different from pressure of water that surrounds a floating boat. If an opening one square inch in area is made 5 feet under water through the side or bottom of a boat, water will flow through the opening with a force of 2.22 lb, this being the pressure or force on every square inch of the hull at 5 feet depth of water.

You will notice that I said side or bottom of a boat. I did this in order to impress upon your mind the important fact that water pressure is *indifferent* to direction. Depth and extent of surface it presses upon are the sole determining factors. It is this indifference to direction that makes the calculation of buoyancy of water so simple.

Here is another word—*Buoyancy*—that needs explaining. The power of water to carry anything afloat on it, such as a piece of wood, or a boat, is called buoyancy. Buoyancy is always proportioned to bulk of the body under water and its force is measured by the weight of water displaced, which is called, when applied to a boat, the *Displacement*.

No possible invention of shape can give to anything the power of greater or less buoyancy than is measured exactly by the weight of water it displaces, and as water pressure is indifferent to shape, if it is desired to carry any known weight all that is necessary is that the surface in the water be large enough to permit the water to exert an aggregate pressure on it equal to the aggregate weight carried. So you can readily understand that the three terms, water weight, water pressure and water buoyancy, have practically the same meaning.

As the word *displacement* was used above, I will next explain its meaning.

3. Displacement

The term displacement, when applied to a boat, means the amount (or weight) of water displaced by a boat when she is afloat. The weight of water displaced will always equal the weight of the boat and everything on board. Displacement is usually expressed in tons (of 2,240 lb), or in pounds, or in cubic feet of bulk.

In boat calculations displacement is, in the U. S. A., generally calculated in cubic measure and expressed in pounds, or tons. The law of displacement is:

1st. That a solid placed under water will displace as much water as its bulk.

2d. That any solid will float when its bulk is greater than that of the water it displaces.

In short, the weight of water displaced and of the body floating on it will always be identical, and the immersed bulk and bulk of water it displaces will always be identical.

Bulk in water equals bulk displaced. Weight of water displaced equals weight of body floating.

The reason for this is that the down pressure due to weight of boat is exactly the same as the up pressure of the water on underwater bulk of boat. From this you can readily understand the importance of correctly calculating the weight of everything that enters into a boat's construction, etc., and also of correctly measuring the bulk of the *intended* underwater portion. For the purpose of illustrating this, we will assume that a certain boatbuilder has marked on a boat the water-line to which he intends it to float. What will happen if the bulk of the body of boat below the marked water-line is not exactly sufficient to displace a volume of water whose weight will be the same as the weight of the boat and all on board?

If the weights are greater than the weight of water that the bulk below the marked water-line will displace, the boat will float *deeper* in the water than intended. On the other hand, if the bulk of the portion of boat below the marked water-line is greater than necessary, the boat will not sink in the water as deep as the marked water-line. Calculating displacement is only a question of correctly estimating weights of construction, equipment, and everything that is on the boat, and for every 64 lb (62.5 lb in fresh water) of weight there must be allowed one cubic foot of immersed bulk. A boat has no power to carry anything, or even to float; the water carries everything. So you see that two separate and distinct calculations must be made before a boat's displacement can be determined; one being a *bulk* calculation and the other a *weight* one. Measuring the bulk of a boat's underwater body is a very simple geometrical problem that can be accurately worked out by anyone having a knowledge of a few simple rules of arithmetic and mensuration. The weight calculation calls for a knowledge of weights of materials that enter into the construction and equipment of the boat, and is also an easy one to make. But while

both problems are simple ones when considered separately they become a little more complicated when considered, as they must be, co-jointly. For you must remember that, as every boat is designed to float to some intended water-line, it is necessary that the portion of boat below the intended water-line be not only correct in *bulk* for the weight but that it also be distributed in such a manner that its center is the same distance from the bow of boat that the center of all the weights is. I will explain this more fully by telling you how a designer calculates the water-line position.

4. How a Designer Predetermines the Load Water-Line of a Boat

The designer who wants a boat to float to a predetermined, or intended, water-line, first of all calculates the weight of everything that will enter into the boat and finds the exact fore-and-aft position of the center of the weights. Next he makes the bulk of that portion of the boat he intends shall be under water exactly sufficient to displace a weight of water equal to the total weight of boat and all on board, and so shapes this bulk that the fore-and-aft position of its center point will *exactly* coincide with the fore-and-aft position of the center of weights.

If the two center points (that of the weight and that of the bulk) do not coincide in a fore-and-aft direction, the boat will float with either her bow higher or lower than intended, and if the bulk measured from the intended water-line displaces more, or less, water than sufficient to float the weights, the boat will float with her intended water-line above, or below, the level of the water.

Thus you can readily see that the problem of predetermining the water-line to which a boat will float calls for consideration of four things:

1st. The weight of the boat and all on board.

2d. The fore-and-aft location of the center of this weight.

3d. The correct proportioning of the bulk below the intended water-line.

4th. The distribution of this bulk in such a manner that its center point will exactly coincide, in a fore-and-aft direction, with the center of weight.

Calculations No. 1 and No. 2 deal with weight, while No. 3 and No. 4 deal with bulk.

Having thus explained, in a preliminary manner, the fundamental principles governing the flotation of a boat, I will now pass to an explanation of the calculations referred to above; but before doing this, I want to impress upon your mind that the purpose of all boat-designing calculations is to *prove* the accuracy of the designer's ideas. Calculations shorten labor and enable a designer to systemize his ideas. They never can be utilized as a substitute for designing ability. No matter how complete a knowledge of calculations a boat designer has, he cannot produce a successful and original design unless he possess *real* designing ability, and this ability is something that cannot be learned from books. The most that books can do is to help the designer increase his designing ability.

5. Explanation of Calculations

In order to make sure that you clearly understand the explanations that follow, I will begin with the *a, b, c* of mensuration and explain as briefly as possible, the meaning of such terms as lines, surfaces and volumes; and the rules for measuring them.

A Line has one dimension only—*length*. The geometrical definition of a line is length without breadth, or thickness, and consequently a true geometrical line cannot be seen. In practice, a line is indicated by means of a mark of even width from end to end.

A Surface has two dimensions—*length* and *breadth*. The *area* of a surface is the amount of surface included within the bounding lines, and is (in U. S. A.) usually indicated in square measure, and expressed in the same terms the measurements are given in.

A Volume has three dimensions—*length, breadth* and *thickness;* therefore, volume is a measure of capacity, or *bulk,* and is (in U. S. A.) usually expressed in cubic units. When making boat calculations certain regular and irregularly shaped lines, surfaces and volumes are met with and have to be measured. The rules for doing this are explained below.

Measuring a Line.—A line in any direction is easily and quickly measured by ascertaining its length.

Measuring Surfaces.—Nearly all regularly shaped surfaces can be quickly measured by using the proper rule for each shape. The principal rules for doing this will be given in the next article.

(*To be Continued*)

Annual Exhibition of Boats and Engines

THE most popular of all the Winter exhibitions in New York, the "Power Boat Show," as it is called, comes at a time when those yachtsmen, who by force of circumstances are obliged to remain in the cold Northern climate are pining for a breath of salt air. The past season of racing and cruising is history, and only a memory. The coming season is drawing near, and at its approach every man who owns a boat or who has ever done any cruising longs for the warmer weather in order that he may prepare for the Summer. The show itself is always attractive because new models of yachts, new developments of engines, new accessories and new ideas in many things are displayed for the first time and the real yachtsman is just as keen about this annual exhibition as his wife or sister is about the display of millinery which comes later on.

This year the show will have many new and attractive features. The boatbuilders have realized that the popular model is the cruiser, a boat in which the owner can race if he so desires or can cruise to unknown parts and become an explorer. Consequently the cruiser will be the feature of the show and some wonderful craft are to be displayed, varying in size from a 30-footer to a 60-footer. Preparedness has taken a firm hold on the yachtsman. He is always patriotic and he has shown already that should this country be threatened, he will be willing to turn his boat over to the Government or to take charge of the boat for any service it may be suited. The patrol or scout cruiser was developed last year and this Winter the further development of that type has been the study of the designers and builders so that the boats exhibited will be not only good cruising yachts, but well adapted for defense work.

It was hoped that the Navy Department would exhibit at least one of the boats it has had built to show yachtsmen its ideas of what a patrol or scout boat should be. This has been found impossible, but instead models are now being made of two boats, the 45 and the 65-footer, and these fully equipped in miniature, will be on exhibition and will prove very instructive to those yachtsmen who are taking so much interest in the Naval Coast Defense Reserve and the Volunteer Reserve.

Fleetwing Wrecked off Cuba

The famous old racing schooner Fleetwing, which finished second in the memorable race across the Atlantic Ocean in 1866, was wrecked on the Cuban coast on November 11th. Fleetwing had had a varied career. She was built in 1865 for James A. Osgood. The next year she started in December with Henrietta and Vesta to race from Sandy Hook to the Needles, Isle of Wight, England. Henrietta finished first and won a sweepstakes of $90,000. Fleetwing had a long career as a yacht and was in 1905 purchased by the Baptist Home Mission Board. For several years she served as a harbor "Gospel Ship."

Whaling Bark Lagoda Housed

One of the attractions to yachtsmen visiting New Bedford next season will be the new Dartmouth Historical Society Building, which contains a correct reproduction of the bark Lagoda. This has been built in memory of Jonathan Bourne, and is the gift of Miss Emily Houlaird Bourne, daughter of the famous whaling merchant. It is an unique building and the only one in the world built especially to house a vessel.

The bark Lagoda was built by a master shipbuilder, Frank B. Sistare, assisted by William Crooke, from plans drawn by Hon. Edgar B. Hammond.

Manhasset Bay Challenge Cup

The Manhasset Bay Challenge Cup is to be returned to the Manhasset Bay Y. C., the original donors, by the Indian Harbor Y. C., and the Deed of Gift revised. This decision was arrived at by the members of the Indian Harbor Y. C., at the annual meeting held at the Biltmore on December 14th.

A challenge is also to be sent for a race for the Cup next Summer. The committee having charge of the races last Summer having decided that Ahmeek, being disqualified, the Cup went to the Nahma, representing the Indian Harbor Y. C., the members of the club had to decide what action should be taken. The Cup Committee has not yet decided on the protests against the Ellen and Hayseed. The owners of those yachts were invited to a hearing. C. P. Curtis, owner of Ellen, attended, but H. L. Bowden, owner of Hayseed, allowed the protest of Joyant to go by default. The committee is carefully considering the facts of the cases and as the decision will establish a precedent, the members of the committee will consider everything very carefully. The decision, whatever it may be, will not alter the winner of the series, but it is felt that if the owners of the two yachts protested violated any rules some emphatic action should be taken which will stop practices of the kind in future races.

It transpired at the meeting that the regatta committee of the Indian Harbor Y. C. asked the Cup Committee to call the last race off and order it resailed, on the ground that six of the seven yachts representing clubs in the vicinity of Boston had conspired to cover Nahma and Joyant in order that Ahmeek, not a party to the conspiracy, might win. The Cup Committee, while admitting that on the surface, the contention of the Indian Harbor Club seemed true, and that it had power to order the race resailed, declined to do so because there was no evidence of the conspiracy except what might be inferred from the way in which the race was sailed. This was not considered legal evidence.

Some members of the Boston contingent boastfully and shamefacedly admitted to yachtsmen at Greenwich that such a conspiracy existed and it was after that the committee urged Addison G. Hanan to protest Ahmeek's measurement. Morgan Barney reported that on remeasurement he found Ahmeek to be 927 lb light and that she carried 30 square feet of canvas more than she should under the rules.

Richard A. Monks, chairman of the regatta committee, and other members held that even if the race had been sailed fairly, it did not mean that Nahma would have certainly won.

Vice-Commodore Mallory, who sailed Joyant, was unable to attend the meeting on account of illness. He submitted the resolution which was ultimately adopted, returning the Cup to the original donors. It is suggested that the deed of gift be changed so that in future races those yachts which in the first two races do not score sufficient points to make them possible winners, be eliminated from the final race of the series.

Commodore W. H. Childs, Vice-Commodore Clifford D. Mallory, Rear-Commodore Leonard H. Dyer, Treasurer Richard Outwater, and the regatta committee, Richard A. Monks, chairman, Abbott P. Brush, and Henry C. Pelton, were reelected. Francis H. Page was chosen secretary; E. Burton Hart and Richard A. Monks were elected directors.



Columbine and Genevieve Racing for Coronado Hotel Cup at San Diego. Genevieve (to Weather), Lipton Cup Winner

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Florida Weather

Editor of THE RUDDER:

Will you or any of your readers give me the following information:

1. Would it be safe for a vessel of about 300 tons displacement, drawing 5 feet of water, to cruise in Florida Bay between Bahia Honda and Upper Matecumbe, that is to say, in the event of a gale or hurricane is there sufficient sea produced that would cause 5 feet draught to touch the bottom in 7 feet of water, which appears to be generally found in Florida Bay? Is a nasty sea to be met with on the shallow ground between Cape Sable and Marathon?

2. At distances from the Cays where a yacht is likely to anchor are mosquitos troublesome?

3. During the fishing season do strong winds prevail?

4. Are the Cays frequented by sporting yachtsmen? If so, which Cays are the favorite resorts?

A FISHERMAN.

These questions were referred to the Hydrographic Office, which supplied the following information:

"Florida Bay is navigable for vessels of 5 feet draught and between Upper Matecumbe and Bahia Honda; while there are numerous shoals, there are 5-foot mean low-water cuts dredged through them, allowing passage between these points. Florida Bay is exposed to Northers in the Winter, but there is shelter to be had behind keys and in the entrance to numerous streams in the vicinity, where small vessels may lie in safety from the heavy seas. In the Winter season the water is not clear, making it difficult to discern the shoals.

"Mosquitos are very troublesome in and about the keys, but offshore relief is found, especially with a breeze. Judging from the experience of a surveying party working these waters, no great inconvenience would be encountered if anchored off in a properly selected position.

"The weather appears to be good during the Winter season, but is frequently interrupted by Northers. Shark River, just Northward of Cape Sable, is frequented by many yachts and small craft during the Winter for fishing and hunting. They usually take a pilot or guide at Fort Myers or Marco. Long Cay is also the headquarters of some power yachts for fishing excursions.

"You are referred to United Coast Pilot, Atlantic Coast, Section E, for sale by United States Coast and Geodetic Survey. Yachtsmen are to be found, especially during the fishing season, around Miami and the Florida Keys."

Reply to Star Class Criticism

Editor of THE RUDDER:

My attention has been drawn to an article and an editorial in the current issue regarding the Star Class.

I can only wish that you had secured your information from some officer of the Association which represents this class of racing yachts, because I would respectfully point out that your text is very misleading and contains a great many inaccuracies.

First of all, there is no trend in the direction of the Stars becoming a "rich man's class," neither is there any known feeling of discontent on the part of any of the yachtsmen participating in the regattas on the Sound.

Your article leads your readers to believe that by reason of certain tendencies among some of the more prominent and expert yachtsmen there is a feeling of unequal opportunity in the various competitions, and that such tendencies are calculated to destroy the fundamentals of a one-design class. Nothing could be further from the facts, since there is no class that has grown to anything like the proportions or strength of this class in the East during the past few years. In regard to the matter of hauling out boats for cleaning, painting, etc., there is no other class on the Sound with boats of similar dimensions on which there are so many careful restrictions, strictly applied, as in connection with the Stars. There are no particular restrictions as to hauling out because it has been found impractical to limit cleaning operations on such small boats. For one thing, the Stars are represented in nearly every club on the Sound and in Gravesend Bay, and because of lack of facilities in one place as compared with improvements and conveniences in another, it has not been found possible to establish a standard period afloat for all.

Regarding professionalism, also, there is no such thing in the Star Class. It is true that in the case of three yachtsmen a paid "crew" is frequently employed, but the tiller is invariably handled by an amateur, and it has been demonstrated beyond question that these boats have done neither better nor worse when an amateur crew has been on board. It simply happens that in these cases the yachtsman has been unable to find a sailing partner upon whom he could regularly depend, and so has been compelled to do that which he certainly would wish to avoid, if possible, namely, paying out money to have some one handle his jibsheets.

I, personally, do not happen to be one of the men so situated, so I am not pleading in my own behalf, but am simply stating the truth for the sake of those who may have read your previous observations on this subject.

The facts are these—and I think the conditions apply to every racing class on the Sound—namely, that there are a few men who take the time, whether it be early morning or late at night, to work on their boats and put elbow grease on the hull. Every opportunity they get these men take their boats out, play with the rigging and take pains to get them tuned up, so that each boat is as fast as her owner knows how to make her, and with no more liberties or privileges as to rigging, sailing area or boat appliances than any other man in the class. These men study winds and tides and take a pride in keeping their boats in shape. Other men regard their boats simply

as a pleasure yacht, going down to their club on Saturday afternoon and Sunday, get aboard and expect to go out and win races. It can't be done.

In addition to this, there are certain yacht clubs—not wealthy clubs, by any means—who take a pride in their racing fleet and encourage the sport by granting them every facility and convenience possible. They build ways on which the boats can be hauled out regularly, and assist not only with prizes, but even to the extent of helping with towing arrangements whereby a maximum number of the racing fleet can attend the Sound regattas week by week.

The consequence is that the yachtsmen belonging to such clubs are keen to keep up the honor of the club flag and to put it across the finishing line wherever and whenever they can. I know other clubs professing to be yacht clubs where no interest whatever is taken in the racing fleet, even to the point where the club officers, in their power yachts and launches, will go by their own club yachtsmen, becalmed on the way to a race—and not even know that the racing men are alive! There are other yachtsmen—and they are to be found everywhere—who are too close-fisted to spend a nickel on a convenient bit of tackle or on the necessary cost of keeping their boat in proper shape. These are the "kickers" who are to be found in every class, every club, and who usually are not in the front ranks.

I know, of course, that there are a number of earnest, hard-working enthusiastic yachtsmen who are really not able to give the time nor the money to the upkeep of their boats that they would like or that some others do, but these are not the "kickers," as a rule, and I never yet saw a man who could be kept out of the season's trophies simply because he was "poor."

There is not a chance in the world of the disintegration of the Star Class. Its yachtsmen are game, enthusiastic sportsmen who are in it for the love of the sport itself, who fraternize with their fellow-yachtsmen with the utmost cordiality everywhere, and who never hesitate to pass on any information they may possess concerning details calculated to increase the speed of the other fellow's boat.

Let us not forget that yacht racing is intended to develop navigators, and navigators are supposed to do everything they can to make their boats safe, seaworthy, and as fast as white wings and seamanship can make them.

ALLEN WALKER,
Secretary Star Class Association.

Championship Points

Editor of THE RUDDER:

In the December RUDDER I read with much interest your account of the Handicap Class of Long Island Sound. Were the results furnished by Mr. Tower?—as they seem to me to be inaccurate, as my boat, Robin Hood III, is charged with 19 starts, which is correct, but instead of 6 firsts, it should be 9 firsts, as follows:

Larchmont Y. C., 5 firsts, being Fourth of July, Labor Day, and 3 firsts during Race Week; New Rochelle, 1 first; Huguenot, 1 first; Seawanhaka, 1 first; Riverside, 1 first. In many of the races I did not have a competitor and had to sail against Ogeemah in the fourth division, or go up in the second or first division, but these races are included in the 19 starts.

You have made THE RUDDER quite a readable paper now, and am glad to see that you give considerable space to the sailing end.



A Fair Crew

I read your editorial about the Manhasset Bay Cup and I concur in what you say. The Indian Harbor Y. C. will hold a meeting at the Biltmore next Thursday, the 14th instant, when this matter will be taken up. It seems to me that the only thing for the club to do is to return the Cup to the Manhasset Bay Club with the request that the rules be amended, and that if three races are sailed any boat that cannot win after the second race should be eliminated; and the rule should also be amended giving the judges power to disqualify a boat at once that attempted to win the race by other means than fair sailing.

GEORGE E. GARTLAND.

Mr. Tower, while he credited Robin Hood III with 19 starts, took into consideration only the races that counted for the championship in giving the wins. It is true that Robin Hood III won in all nine firsts, three of which were during Larchmont Race Week.

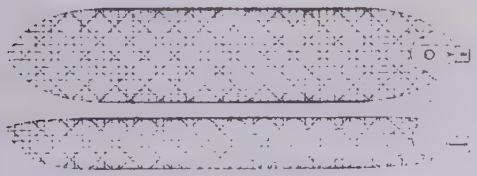
Power-Driven Raft

Editor of THE RUDDER:

Enclosed is a rough drawing of a marine or ocean-going raft, which I have patented. The lines represent ⅝-inch round mild steel rods which are laid 5 feet apart, lengthwise, crosswise and perpendicular and are welded with the oxy-acetylene flame at crossings of the three rods. There are also six sets of sway braces laid in and welded wherever they come in contact with the other series of rods. The whole is constructed during the stowing of the timber, that is, when timbers to a depth of 5 feet have been laid in, then a series of lengthwise and crosswise rods are welded against the uprights and so on until the whole assumes the form of a huge cigar and is essentially solid, being strongly bound thus both inside and oustide.

The idea at first was to tow these rafts across the ocean, but owing to the scarcity and high price of tugs, I think it would be quite feasible to install power in the stern of a raft: by simply making a cell to contain the engine and crew and building that in securely while piling in the timber. This cell containing the engine, etc., would essentially be under water and completely covered over with the timber, except the communication to the

deck of the raft through the conning tower, as the raft will set very low in the water and the seas will roll over her. Thirty-day acetylene gas lights will be lit at the beginning of the voyage so that lights will not have to be attended to by the crew. Fuel tanks will be built in separately. Now I write to ask you if you would be kind enough to direct me to the makers of gasolene or kerosene engines suitable for such a job as this. If I can get engines suitable they are all that would have to be returned, as the steel rod used in the raft construction is essentially



scrapped after its trip and new rods are used on the next raft. Timber is being gotten out now for twelve of these rafts for next Summer.

We want something strong and steady with a moderate fuel consumption, and would expect a speed of 4 to 5 miles per hour. What horsepower would you suggest as being necessary? If this is of interest to you I will be glad to give you further details, and when the rafts are built will send photographs.

What kind of fuel oil should be best?

IVAN A. BAYLEY,
Inventor.

Bell Signals on the Lakes

Editor of THE RUDDER:

On page 575, of December RUDDER, in your reply to T. L. Johnson, Michigan, you give the bell signals in use by merchant vessels on the Atlantic Coast and inland waters. Will you please give the rules, by whistle and bell, in force on the Great Lakes?

New York. P. E. AUSTIN.

On all navigable waters of the United States, except on the Great Lakes, the bell signals as given are correct. On the Great Lakes and tributary waters as far East as Montreal, on the Red River of the North and rivers emptying into the Gulf of Mexico, a bell or small whistle in the engine room may be used for signaling, the code being as follows:

One bell or whistle—stop.

Two bells or whistles—ahead, slow.

Three bells or whistles—back.

Four bells or whistles—ahead or back full speed.

Four bells or whistles—all right.

On nearly all steam vessels an engine room telegraph is now employed, the engineer answering every signal, both such signals being recorded in the pilothouse and engine room.

There is one bell signal which was omitted in our reply to Mr. Johnson. This is the use of the jingle bell to notify the engineer to stand by, and also to indicate that the landing has been made and his attention is not further needed.

The Chart Table

Editor of THE RUDDER:

What is a rhumb line?

New York. T. P. FRANKLIN.

A rhumb line is a line on the earth's surface which cuts all the meridians at the same angle. If a vessel sails on a course between two points, cutting all the meridians at the same angle, she is sailing a rhumb line. This is generally done in case of short distances (200 miles or less) but for longer courses a great circle course is steered if possible.

* * *

Editor of THE RUDDER:

How do you determine the amount of leeway to allow for a strong breeze on the bow?

Boston. X. Y. Z.

You have to determine that for each particular boat by observing how much leeway she makes under varying strengths and bearings of the breeze. A little judgment acquired by practice will take care of the question of leeway. Remember that moderate sea pounding on the bow will slowly drive a boat to leeward as well.

* * *

Editor of THE RUDDER:

Would you give an example of the method of working a meridian altitude of the sun as you would work it at sea?

Massachusetts. B. T. COSTON.

Tues. Oct. 17, 1916—Long. 26° 54′ W.
Mer. altitude 30° 38′. G. M. T. noon, 1:37:54.
Height of eye, 50 feet.

Long. in time 1:52:00	90°00	
	9°16	Dec. S for 1 hr. 37 min.
Eq^t. 14:36	80°44	
G. M. T. noon 1:37:24		8 Cor. for Par. Refact and Semi-Dram
Constant for Day	80°36	Obs. Alt.
	30°38	
	49°58	Latitude

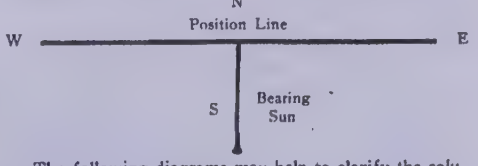
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Editor of THE RUDDER:

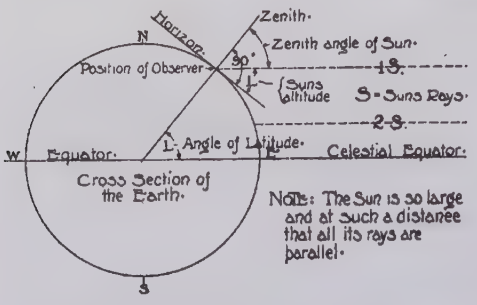
Why does the meridional altitude of a body give the latitude of a place most accurately?

New York. F. C. WORK.

First, remember that the line of position obtained by observation of a heavenly body is always at right angles to the bearing of the body. When the body bears due North or South the position line runs East and West, giving a latitude line which is correct regardless of longitude.



The following diagrams may help to clarify the solution: 1st Case.—Consider the sun on the equator, i. e., having no declination and the observer on the surface of the earth so there will be no dip to the horizon.



The horizon is a line tangent to the earth's circumference at the point of observation. In this case as the observer is at the surface the theoretical and observed horizons coincide.

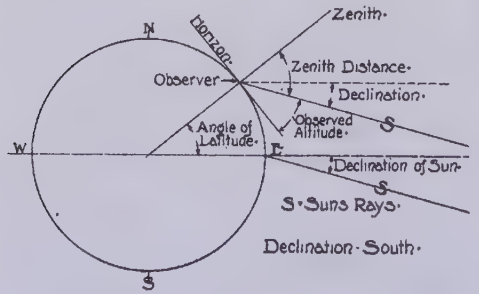
The altitude (h) is that measured by the sextant.

From the diagram—

Zenith angle = 90° — (minus) observed altitude of sun (disregard connections for semi-diameters, etc.)

Angle of latitude (L) = Zenith angle.

Parallel lines cut by a transversal the interior and exterior angles on the same side of the transversal are equal.



∴ Latitude (L) = 90° — Observed Altitude.

Now consider the case where the sun has North or South declination:

2d Case.—Angle of latitude = 90° — (Obs. Altitude + Declination). The same diagrams apply to the moon, planets or stars.

* * *

Editor of THE RUDDER:

What causes an offshore breeze in the night so frequently in the Summer on our coast?

Connecticut. FAIR WEATHER.

The land becomes abnormally heated during the day and produces a low pressure and the breeze blows steadily on shore until evening to even up the pressure. During the night the land loses its heat much more rapidly than the sea and conditions are reversed, a light breeze blowing off the land until after sunrise.

Editor of THE RUDDER:

When is the only time a sailing vessel must keep out of the way of a steamer?

New Jersey. L. O. WEST.

When the sailing vessel is overtaking the steamer.

* * *

Editor of THE RUDDER:

Does lightning ever affect the compass?

Pennsylvania. H. BANKER.

Sometimes a discharge in the vicinity of a vessel will change the deviations of a compass, but it is a very rare occurrence, unless the vessel itself is struck by lightning. I have been on a sound steamer when struck by lightning which reversed the poles in the card needles, the South point indicating North.

The Engine Room

Editor of THE RUDDER:

If I run down-stream with the current 3½ miles in 15 minutes 20 seconds and up-stream the same distance against the current in 18 minutes 54 seconds, how fast am I running? This to decide a bet.

New York. H. L. ARMITAGE.

Going down-stream the rate was 60 ÷ 15 20/60 × 3½ = 13.69565 miles. Going up-stream the rate was 60 ÷ 18 54/60 × 3½ = 11.5873 miles. The average is 13.69565 + 11.5873 ÷ 2 = 12.64147, and is not found by dividing 60 by ½ (15 20/60 + 18 54/60) and multiplying by 3½, which would give you 12.26874+ and is incorrect.

To illustrate, take the following: With a 2-mile current a boat at 8 miles' speed goes down-stream 10 miles in one hour, and in returning during the first hour will make 6 miles and will take 1⅔ hours to make the 10 miles. The total elapsed time up and down is 2⅔ hours, and one-half of this is 1⅓ hours. Sixty minutes ÷ 80 × 10 = 7½ miles per hour, when you know the boat makes 8. On the other hand, 60 ÷ 60 × 10 = 10, and 60 ÷ 100 × 10 = 6. The average is the speed down-stream, 10 miles, + the speed up-stream, 6 miles, ÷ 2 = 8, which is correct. To prove it still stronger, presume that the current is 6 miles per hour and the boat makes 8 miles per hour. The results above would show a still greater disparity, and if the current was the same speed as the boat, she would never get back.

* * *

Editor of THE RUDDER:

My boat has a propeller wheel which the makers claimed to be 36-inch pitch. They said that the slip should be about 25% at a speed of 10 statute miles. From several speed tests I have made I find that in running 27¼ miles my slip is just over 9 miles. I have computed this by multiplying my total number of revolutions by the pitch expressed in inches, and reduced this product to statute miles. Is not my slip approximately 33⅓% rather than 25%, which the wheel manufacturer predicted?

North Carolina. R. W. HUDGINS.

Had there been no slip your boat would have traveled 27¼ + 9 = 36¼ miles. The slip is therefore 9 miles in 36¼, or approximately 25%. The base should not be

the net but the gross distance the wheel would have carried you with no slip. This reminds us of the old percentage question, where the farmer sold two horses for $300 each, making 25% on one and losing 25% on the other, and instead of "breaking even," he found he had lost $40 in the double transaction.

* * *

Editor of THE RUDDER:

What objection is there, if any, to the use of aluminum for marine gas engine bases?

Maryland. ROBT. T. HARKNESS.

Outside of its cost, the most serious objection to aluminum is the effect which salt water has upon it, rapidly destroying it. Some engine manufacturers have used aluminum crank cases in special installations, but usually they have been treated with hot boiled linseed oil or some similar bath, to resist the action of the salt water. This objection, of course, would not hold if the boat were to be used exclusively in fresh water.

* * *

Editor of THE RUDDER:

Gasolene manufacturers used to mark the gravity of the product on the containers, but of late I have noted markings as follows on cases: "Gasolene 'Explosive Gravity' 60." Explosive gravity sounds like nonsense to me. Will you kindly explain present marking of gasolene containers and oblige?

Alaska. OLD SUBSCRIBER.

There are certain rules and regulations covering the shipment of gasolene. One of these is that it shall be marked "gasolene" or "naphtha," another that it shall be plainly marked "Explosive," while we believe certain localities in addition, compel the gravity by the Beaumé scale for liquids lighter than water to likewise appear. The marking should be something like the following: "Gasolene—Explosive—Gravity 60." The specific gravity of 60° Beaumé is .737.

* * *

Editor of THE RUDDER:

In the description of Dr. J. C. Ayer's Shadow III, the engine speed is said to be 835 r.p.m., and the propeller speed 375. Will you please explain the usual method of reducing the propeller speed without reducing the crank-shaft speed? Also is not the slip of the propeller excessive in this case?

Virginia. JOHN J. JOHNSON.

Whenever it becomes expedient, as in a hydroplane, to have the engine located as far aft as possible, the flywheel of the engine is set aft, with the crank shaft and reverse gear pointing downward. A short shaft connects with the smaller of a set of two bevel gears in a rigid housing or casing. The propeller shaft is connected to a short shaft carrying the larger bevel and leads aft below the engine and outboard. If there are 41 or 82 teeth in the smaller bevel, and respectively 90 or 180 in the larger, the reduction would be in the proportion $90 : 41 :: 835 : x = 380.+$ instead of 375.

With reference to the slip percentage, driving without slip at 375 r.p.m., the speed would be 17.044 miles per hour. Deducting the claimed speed, 10.36 miles, and the slip is 6.684 miles, or 33.35%, which does not appear excessive.

* * *

Editor of THE RUDDER:

Will you please define the difference between wharf and dock? There seems to be an idea that "dock" is often used when "wharf" should be. In like manner will you please define the word "beam" when used to describe a vessel's breadth?

New Jersey. E. P. ATWOOD, JR.

A dock is a slip or opening between two wharves or piers, and a wharf is a landing place. To dock a vessel is to make a landing beside a wharf in a dock. We maintain that "beam," used to express a vessel's breadth, is grossly improper, for all common usage seems to sanction its use.

Pauline, 40-Foot Champion

The Pauline, owned by O. G. Jennings, and not the Jessica, won the championship of the New York Y. C. 40-footers. An error was made in figuring the points, and there seems to have been a slight misunderstanding about the method of figuring the winner of the series. This matter was referred to Captain Grenville Kane by the committee having charge of the class and he has ruled Pauline as winner of the Cup which he offered. His letter follows:

Your committee having requested me to decide the question of who is the winner of the 1916 Championship Cup offered by me to the class, I beg to submit the following decision:

During the past season sixteen designated races were held and a score sheet was kept showing the number of times each yacht started and the number of points she won in each race. My letter to you of May 15th, donating the cup, states:

The Cup is to be awarded to the yacht which shall finish first in the above series of races, the system of scoring to be as follows:

In each race, each yacht competing will be credited with as many points as the number of yachts she defeats, with one point added as a premium for sailing the race.

1. A yacht which starts and does not finish, or a yacht which, intending to start, crosses the starting line ahead of the starting signal and does not return, will be counted as having started, and will be credited with no point and will be counted as a defeated yacht in crediting points to yachts which complete the race.

The award of points will be made each race day on the basis of twelve yachts starting on any race day, it being assumed for the purpose of this series that the number of yachts starting in a race is the same in each race.

2. That yacht shall be awarded the championship which has the highest percentage based on the ratio which the total number of points she has at the end of the season bears to the total number of points she would have had if she had won every race in which she started.

3. A yacht, to qualify, must start in at least 13 of the races sailed on the dated schedule for such races, but a yacht which has not sailed in enough races to qualify shall nevertheless be counted in crediting points to other yachts which may qualify.

4. Yachts sailing in the above series shall be subject to the special rules governing the New York Yacht Club one-design 40-footers when sailing as a one-design class.

According to this system, the percentage of each yacht is derived from a fraction, the upper figure of which is the total number of points won, and the lower figure the total number of starts multiplied by 12. (See Points—Points Possible in table.)

The question of disqualification is treated in paragraph one of the rules, and two causes for disqualification, viz., a false start or a failure to finish, are specifically provided for. Disqualification for other causes such as a foul, though not mentioned, is covered by paragraph four. A yacht, therefore, which has been disqualified for any cause in a race must be charged with that race in figuring her percentage, and this course has been followed in the official score sheet, which is given below:

Name	Starts	Points	Points Possible	Per Cent.
Pauline	14	123	168	.732
Jessica	16	140	192	.729
Maisie	16	140	192	.729
Mistral	16	140	192	.729
Zilph	15	124	180	.688
Pamparo	14	114	168	.678
Rowdy	15	116	180	.647

The Pauline, therefore, wins the 1916 Championship Cup, with the Jessica, Maisie and Mistral tied for second place.

THE RUDDER

Published on the Twenty-Fourth of the Month
BY
THE RUDDER PUBLISHING COMPANY
254 West 34th Street, New York, U. S. A.
To whom all communications should be addressed
Down Town Sales Office
9 MURRAY ST., NEW YORK
Arthur F. Aldridge, President
Andrew Paterson, Vice-President and Business Manager
James R. Thomson, Treasurer
Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

THE RUDDER at this festive season of the year wishes all its readers and friends health and happiness. May the new year bring wealth and prosperity to all.

Standardization

The National Association of Engine & Boat Manufacturers has allied itself with the Society of Automotive Engineers. This is progression and a big step towards solving many of the troubles of the engine and boat builder and the yacht owner. It means standardization. The Automotive Society now includes the automobile, marine and aeroplane engineers, and it will be expanded to include stationary engines and other fields to which the gas engine is being extended. It may be visionary, but in time this society intends to do more than take a passing interest in the manufacture of the gas engine. It will certify the quality of the output of the many manufacturing interests and by this certification a purchaser will be assured that the product he is interested in will do all that its builders assert for it.

Now High Cost of Engines

The high cost of living has now hit the boatbuilding and engine industry. It was only natural that it should. Materials used in building boats or in the manufacture of engines have increased very much in price and then, too, the difficulty of obtaining this material must be taken into consideration. Labor has increased in cost and so the manufacturers have been forced to increase their prices. To the man of means who purchases a large engine or has built a commodious yacht this does not mean much, but to the man of small means, the man who uses a low-powered engine in a boat which he overhauls himself, it means much. He has not only got to pay more for his living expenses, but his means of sources of fun and recreation will also cost him more, and some will have to postpone their fun this Summer unless conditions change. Higher prices always hit the small men the hardest and the small manufacturer consequently suffers.

Manhasset Cup Returned

The Indian Harbor Y. C. has decided to return the Manhasset Bay Challenge Cup to its original donors, the club for which it is named. The deed of gift is to be re-drawn and it is hoped that there will be no more trouble in future racing for this important trophy. The Indian Harbor yachtsmen agreed that had the last race been sailed fairly, Nahma might still have been beaten, and the club did not care to retain a prize won by protest and disqualification. The cup committee is considering the protests against Ellen and Hayseed. It will consider each case very carefully before rendering a verdict because the committee realizes the importance this decision will have on future racing. It is a matter of satisfaction to all that the dispute is in the hands of such a competent, painstaking committee. James D. Sparkman, Stuyvesant Wainwright and Frederick M. Hoyt have the full confidence of all yachtsmen.

How to Build a Catbird

Another How-To is offered to RUDDER readers. F. W. Goeller, Jr., has designed plans of a 12-foot, flat-bottom skiff. These plans are so complete that a boy could build the boat without the explanatory matter printed with the plans. This boat has been designed for the amateur and made as plain and simple as possible. To build one would be the ideal work of a boy in a Summer school. This skiff is suitable for inland and fairly protected waters, small rivers, etc. It can be fitted with a moderate sail plan, which gives enough spread to drive the boat to windward in smooth water. As a row-boat or tender it will be easy to row, or if desired, will tow easily.

The Rudder Designing Competition

Designers and those who are not by profession designers, but who understand much about marine architecture, are invited to take part in some competitions for which THE RUDDER offers prizes. These designing competitions have proved so popular in the past that this time five different competitions are arranged for. Baron Barreto offers a prize of $50 for a fishing boat for use in Florida waters, and THE RUDDER adds the second and third prizes. Then there are prizes for a 40-foot shoal-draught work boat, for the best interior arrangement of a 30-foot cruiser, for the best arranged stateroom and for the best arranged galley. The conditions to govern these contests and the plans are to be found in another part of this magazine. These competitions are open to all, the conditions are simple, and there is no reason why the contestants should not far exceed in numbers those of similar competitions in the past.

Sea Mews Popular

The 14-foot catboat Sea Mew, plans of which were published in the November issue of THE RUDDER, has proved very attractive to yachtsmen all over the country. Estimates have been furnished by several builders of small boats. Isaac E. Smith, of Port Washington, made the lowest bid. He will build the cat-rigged boat complete with spars and sails for $145, and the sloop-rigged boat for $158. Smith built the original Stars and every-

one knows what a good boatbuilder he is. He is at work now on eight Sea Mews for members of the Harlem Y. C., and it is probable that in all twelve will be ordered for that club. Gravesend Bay yachtsmen will place an order in a few days and so will yachtsmen of the Great South Bay. The Sea Mew is a safe and sane boat, well suited for the use of young boys. It was designed mainly with the idea of interesting the younger generation in yachting. Unless the boys are taught to love the sport yachting will soon die.

The Rudder Made More Attractive

THE RUDDER this month is larger and better than ever. The magazine section is 64 pages of well-illustrated interesting matter, and there is a full-page supplement of one of the best of Uncle Sam's torpedo-boat destroyers, the Benham. The first of a series of articles by Mr. Charles Desmond appears in this issue. It is "The Designing of Power Boats Explained in Terms that the Layman Can Understand." Mr. Desmond is an authority. His recent articles on shop efficiency which were printed in the Quarter Deck Section proved so popular that he has been induced to write more on designing. In addition to this, there are the usual pages of advertising and the Quarter Deck Department. In this section is an article on the increased cost of materials and an article on "Gas Engine Designing for the Average Man." The engine men as well as the "average man" will be interested in this. To those yachtsmen who contemplate having new yachts, new engines or anything new next season, a careful study of the attractive advertising pages is recommended. This number of THE RUDDER sets a new standard for the magazine. It contains much that will interest a yachtsman, no matter what phase of the sport he patronizes.

The fitting-out number of THE RUDDER is growing. Many owners who understand what this number is to the yachting world as a means of disposing of their yachts have already sent in their announcements, which are to be placed in the pages devoted to yachts for sale. This huge illustrated catalog, which was originated in THE RUDDER many years ago, is not only a list of those vessels that may be purchased, but is really an illustrated list of yachts of all types and sizes and as such is of interest to all who participate in the sport. Many special features are to appear in this number. It takes time to print, and as there will be a great demand for this number, orders should be placed early, either directly to The Rudder Publishing Company, or with the newsdealers.

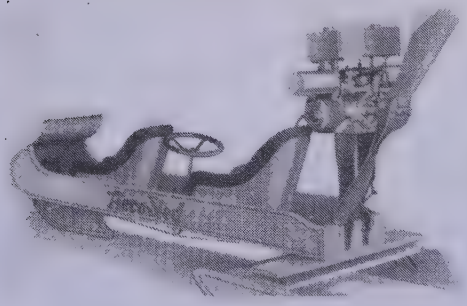
Aeroplane Wheel for Sled

ONE of the latest of the Winter sports which promises to be very popular if the weather is cold enough to make ice is sleighing with an aero sled. Vincent Astor has purchased one of these novelties and others are following his example. The aero sled is built to seat two persons. It has three runners, one in the front and two abreast behind and it is driven by a small engine which operates an aero propeller. Two engines are made for this new sled, one of 3 h.p. and one of 5 h.p., and on good ice 6 to 8 miles an hour can be had with the smaller engine and 8 to 10 miles an hour with the larger one.

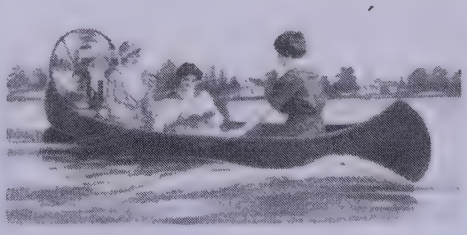
The aerothrust, as the engine is called, is of two cylinders, opposed, two-cycle aeroplane type, 2½-inch stroke. The magneto is high-tension, built-in flywheel type, and is waterproof. It is fitted with a carbureter, special mufflers and steering attachment.

Those who have tried sledding in this way say it is a fascinating sport and hundreds of these sleds will be seen on all frozen waters this Winter.

It is a convertible toy, too, because in the Summer, when ice has disappeared, the engine and wheel can be attached to a canoe or small boat. The canoes have already become popular and one particular advantage of this means of propulsion is that there is no wheel in the water to cause trouble and the canoe can go into shoal water without any danger of the wheel hitting bottom and can also go among the weeds and grasses without it becoming fouled. It is a most useful means of propulsion for those who enjoy fishing and want to get to those fishing grounds that are protected by grasses and weeds where an ordinary power launch could not approach.



Aero Propeller on Sled



Aero Propeller on Canoe

Spokes from the Rudder Wheel

L. Gordon Hammersley, who recently purchased the 50-foot sloop Acushla, is to have an express cruiser built from designs by W. H. Hand, Jr., which, with two Duesenberg engines, will make 35 m.p.h.

* * *

The U. S. Coast and Geodetic Survey has issued a new edition of the "Inside Route Pilot, New York to Key West." It contains description of the waters traversed with directions for navigating them and much information of value to those making this trip.

* * *

Former Commodore Cornelius Vanderbilt has purchased from Morton F. Plant the schooner Elena. Elena was built by Herreshoff in 1911, and has been conspicuous in racing since then. E. Walter Clark intends to have Queen in commission next season and the racing between these two yachts will be very keen.

* * *

Many yachtsmen who are interested in the Naval Reserve are waiting for the present law to be changed and then plan to build new patrol or scout boats which will conform with the suggestions made by the Navy Department. * * *

Yachtsmen who cruise on Long Island Sound and visit the Thimble Islands will be sorry to hear that Leo Spitzer, proprietor of a hotel on Money Island, died in a hospital in New Haven on December 8th. Spitzer was in his 56th year. He was keeper of one of the first RUDDER stations and was very popular with yachtsmen.

* * *

A new measured mile course has been laid off on Huntington Bay, L. I. The marks designating the start and finish are on Eatons Neck, the outer ones are on the beach and the inner ones on the Sand Spit. The distance surveyed is 6,080 feet.

* * *

The schooner yacht Mariette, built in 1906, and owned for many years by Jacob F. Brown, has been purchased by the U. S. Government, and is to be one of the Hayti Coast Guard fleet. The yacht is now being overhauled at the Baker Basin, Quincy, Mass. The Mariette was built on the lines of a Gloucester fisherman, and is 50 tons register, 87 feet over all, 18 feet breadth and 12 feet draught. She is equipped with a 56-h.p. Murray & Tregurtha engine.

* * *

The New York A. C. has announced that in its annual race to Block Island a prize will be offered for boats with an average speed of from 13 to 18 miles.

* * *

Former Commodore Morton F. Plant, of the Larchmont Y. C., has purchased from J. M. Macdonough the 50-foot sloop Spartan. Spartan was originally owned by Edmund Randolph and raced by him in her first season, after which she was sold to Mr. Macdonough.

* * *

The Long Island Sound Power Boat Association has arranged for a race to Newport for the prize offered by *The Herald*. It will be for express cruisers 30 to 70 feet and the cruiser class 30 to 60 feet. The start will be made from off Huckleberry Island on August 25th.

The auxiliary yawl Sayona, recently sold by W. O. Goodman, of Chicago, to Manuel de Ajuria, of Cuba, started on December 6th for her new home port. She was in command of Lieutenant Commander Eckford C. de Kay, and on board were G. E. Megarel and V. H. Barranco and a crew of three men. Sayona was built in 1900 from designs by Theodore E. Ferris, by J. M. Bayles, at Port Washington. She is 66 feet over all and is equipped with a Standard engine.

* * *

The Canadian torpedo-boat destroyer Grilse limped into Halifax Harbor on December 14th leaking badly and much damaged. Grilse was formerly the steam yacht Winchester III, owned by P. W. Rouss. She was sold to Canadian interests shortly after the war began, but was held here by the U. S. Government. Some months later she was transferred to W. A. Rogers, who in turn sold the yacht to Sir Charles Ross. Winchester went to Halifax, was presented to the Canadian Government and renamed Grilse. Grilse left Halifax on December 11th for Bermuda and ran into a very heavy gale. Wireless messages received said she was sinking and she was given up as lost. Six men were washed off the vessel's deck and lost. * * *

The steam yacht Colonia, once owned by former Commodore Frederick G. Bourne, and a flagship of the New York Y. C., has been sold by John W. Hubbard, of Pittsburgh, to G. S. Dearborn, of New York. The transfer was made through the office of Cox & Stevens.

* * *

Frederick Walbridge, of New York, has sold the steam yacht Legonia to parties interested in the sugar trade. The yacht was recently delivered to her new owners at Pilon Harbor, Cuba.

* * *

Frederick F. Brewster has sold the schooner Elmina to William H. Farrell, through the agency of Cox & Stevens. The rig of the yacht is to be reduced and an auxiliary engine installed. Elmina was built from designs by A. Cary Smith, by Lawley, and won many trophies. Mr. Farrell will rename the yacht Mystery.

* * *

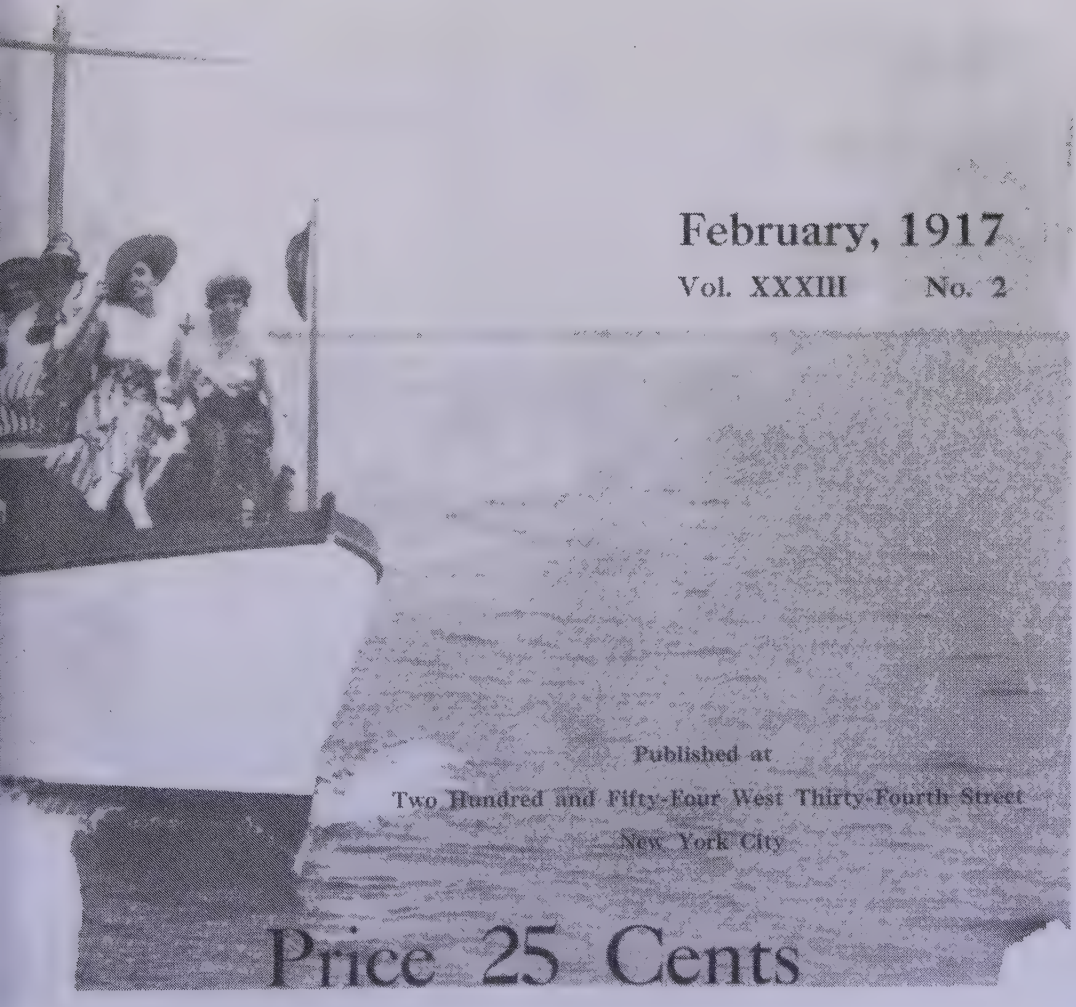
Eight members of the Harlem Y. C. have placed orders with Isaac E. Smith to build Sea Mews and four others will join the class shortly. The owners of these boats will be Commodore Harold W. Kraussman, Commodore-elect Arthur Hall and Philip Schneider, Alan Gibson, Robert Haydock, Alexander Hutchinson, John Wimmer, Philip J. Fox and F. W. Goeller, Jr.

* * *

Fire on Rodman Wanamaker's steam yacht Nirvana, on December 14th, caused considerable excitement in the Marine Basin, Bath Beach, where the yacht was fitting out for a Southern cruise. The fire started in the engine room and spread to the forecastle. Noma, Wakiva and other large yachts were stored near by and some were towed out into Gravesend Bay. The damage will be repaired at once. Nirvana was originally the Rheclair, and was built for Daniel G. Reid. Later the yacht was sold to Hon. Nelson W. Aldrich, and on his death, was purchased by Rodman Wanamaker.

FEB 1 1917
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THE RUBBER



February, 1917
Vol. XXXIII No. 2

Published at
Two Hundred and Fifty-Four West Thirty-Fourth Street
New York City

Price 25 Cents



"Tramp is a Beauty— Perfect in Every Respect"

The Plaza
New York

TO THE MATTHEWS BOAT CO.
Port Clinton, Ohio

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As for myself, I can't begin to express my gratitude to the architects and builders who made it possible for me to get so much pleasure out of the boat during this past summer, and anticipate having many better summers in the future.

Most sincerely yours,

November 5, 1916. *Mrs Mark Hanna*

Tramp II is a salt water yacht, 90x16 feet, twin screw—a quality craft such as only the Matthews plant can build. Invariably Matthews craft satisfy their owners. ***You can be satisfied too.***

THE MATTHEWS BOAT COMPANY

Marine Railways, Storage Basin and Works 603 Laurel Ave., PORT CLINTON, O.



A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | February, 1917 | No. 2

National Power-Boat Show

YACHTSMEN from all parts of the country will gather in New York this week for the annual exhibition of power boats and engines which will open in the Grand Central Palace on Saturday, January 27th. Until the following Saturday night representatives of the many industries devoted to power yachting will meet yachtsmen and others who are interested in boats. They will talk boat morning, noon and night, and for a brief period in mid-Winter will get a sniff of the salt, and their thoughts will turn to the coming Summer when all will again be following their favorite pastime —cruising or racing.

This annual exhibition, which is one of the most popular of the Winter season, is now in its thirteenth year. Its thirteenth anniversary will be celebrated when the show is formally opened. It has developed from small beginnings until now it is hard to find room for the many exhibits and the National Association of Engine and Boat Manufacturers, under whose auspices the show is held, will have to find more space if the demand for show privileges is increased as it has grown in the past.

The annual show of power boats, engines and accessories brings under one roof products from all parts of the country, and it affords those who own boats or who contemplate buying or building opportunities to see the very best that can be obtained. It enables a prospective purchaser to compare one type of boat with another and to see the advantages of one engine over another and so determine in a sane manner what is best suited to his wants.

Styles change in power boats just as they do in milady's gowns or bonnets, and with many patrons of the sport it is absolutely essential that they should own a boat of the latest fashion and that it should be driven by an up-to-date engine and fitted with the latest and most modern appliances for speed, comfort and reliability. Of course these sportsmen are comparatively very few compared with the number of power-boat owners in this country, but even those who use the same vessel for several years make changes in their craft, bringing them up-to-date each season as far as possible, and when they purchase new boats they must be of the best. There are many yachtsmen who wait until the annual exhibition before selecting the boat or the engine they will use in the coming Summer, and to these the gathering of many types of boats, many makes of engines, and of other things pertaining to a power boat, the annual exhibition is a great boon. According to Ira Hand, the indefatigable secretary of the association, "this, perhaps, means more to the ex-

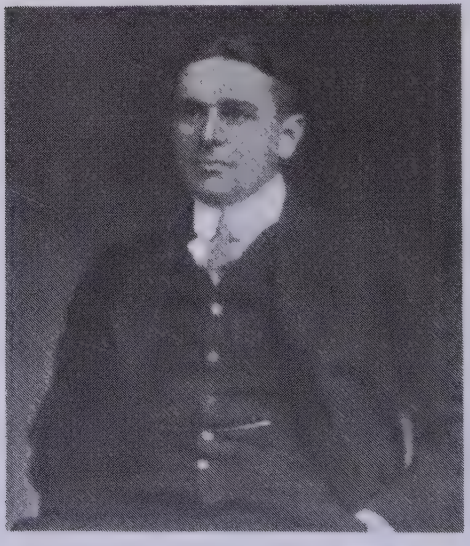


John J. Amory, Who Has Been President of the National Association Since Its Organization, in 1904

perienced yachtsman than to one who has never owned a boat. The newest models are spread before him in a delightful profusion. The man who already owns or has owned a boat will tell you that his intention to keep up-to-date in his equipment is not so much a matter of personal pride as it is his desire to take advantage of any advance in design or mechanism that will make for greater efficiency, performance or comfort. Many thousands who have never owned a boat will, however, attend the show to gaze upon and admire the various craft, and to look forward longingly to the time when they, too, will be the proud possessors of a cruiser, runabout or launch 'just like the one we saw at the show'."

The show makes new converts to the sport. Visitors become fascinated with the boats. They learn that they are not as costly as they thought. They learn just what each type will cost to maintain and often decide that running a power boat is not nearly as costly as running a car, and that it affords an infinitely better medium for healthy amusement and a never-ending variety of entertainment.

With the builder and manufacturer the value of this show is proven by its success. At first builders were somewhat shy of exhibiting because of the expense. It costs lots of money to ship engines and boats from the different building centers and to place them on exhibition in an attractive manner. It is very costly to maintain for a week or ten days an elaborately fitted up showroom and a staff of experts who will answer intelligently the thousand and one questions that visitors will put to them about the boat or engine they display. But they have learned by experience that the show is one of the best means of advertising and by the co-operative methods used in the management of the show, these expenses are reduced to a minimum. As a matter of fact, with the majority of the exhibitors this annual exhibition is the best sort of advertising they can obtain.



Henry S. Sutphen, Vice-President and Chairman of the Exhibition Committee

For many weeks now all the exhibitors have been busy preparing for the show and during the coming week they will display the results of their work and be in a position to ship at once duplicates of stock boats and the new engines of almost any power.

This year the popular fancy runs to the navy type of vessel. These are in the form of patrol or scout cruisers, or as some concerns call them, military type cruisers. Last year, as a lesson learned from the great war, it was realized what a state of unpreparedness this country was in. Not only was the Army and the defenses of the country in poor shape to repel an invasion, but the Navy itself was not all that it should be. It was learned, too, that it was absolutely necessary to have a well-developed coast defense, and the big orders placed in this country by England, France and Russia for power boats which were used for patrol duty, for guarding harbor entrances, mine fields, dragging for mines, chasing submarines and many other duties, told citizens here that it would not be well to wait until the country was attacked before starting to defend, but to develop defenses at once.

Bills were introduced in Congress and many were made law which strengthened our Army and Navy and the yachtsmen, not waiting for our National Legislators, got busy on their own account. A committee of patriotic men induced the Government to allow civilians to train on battleships, and that committee secured the enrollment of some 2,300 men, who spent three weeks at sea learning the duties of those who handled the big warships. Another committee enrolled many of the owners of power and steam yachts and these participated in a week of maneuvers with warships, their owners learning just what their duties would be in time of war, and how they could best help in the defense of the country.

A bill was passed, which, as it stands at present, requires yacht owners, who are willing to join the movement, to enroll their yachts and themselves for a period of four years and to devote two weeks in each Summer to maneuvers and one week each Winter to study in the Navy Yards. There are some objections to the law, as it now stands, and it is very probable that changes will be made shortly and when these have been done the new movement will receive a decided boom.

The Navy Department was so anxious to secure the service of the yachtsmen and their vessels that it had two boats built, one 56 feet long and the other 65 feet long, which show just what type of boats is best suited to the work the patrol fleet has to do. These models simply suggest the construction and those who wish to build for this fleet can have the interiors arranged to suit themselves. Since last Summer many new boats of the patrol type have been built, and others will be built just as soon as the present law has been modified. It is this type that will predominate at the show.

This being Naval year the Navy colors, blue and gold, will predominate at the show. These decorations will be most artistic. Some elaborate decorative schemes have been seen at the show when it was in Madison Square Garden. Once the building resembled a big pier with two huge steamers, Mauretania and Olympic, moored at the sides. Venice was the scene another year, and the setting was most artistic. The Grand Central Palace does not need much decoration, but little touches here and there help make the scene very attractive.

This year fifty-eight boats will be shown on the main

floor. These will vary in size from the Chingachgook, with her guns mounted, to 12-foot skiffs. The Chingachgook, 60 feet long, is exhibited by the Greenport Basin & Construction Company. The Gas Engine & Power Company will have a 52-foot cruiser, The Luders Company a 55-foot cruiser, the Elco Company a 50-foot cruiser, the Great Lakes a 50-foot military cruiser, and the Albany Company a 40-foot cruiser. These boats will all show the development of the patrol boat type and the Navy and preparedness will be the watchword.

The educational features of the show will also be more attractive than ever. The U. S. Coast and Geodetic Survey will show how charts are made and explain how they are read. The U. S. Lighthouse Board will have a lighthouse with a revolving light, foghorn, etc., all working. The Weather Bureau will have charts of the entire country, showing the weather stations, and will explain how the weather is forecast. The Motor School of the Y. M. C. A. will have a booth and explain the gas engine. The Navy League, Naval Civilian Training Committee, Waterways League, U. S. Volunteer Life Saving Corps, American Power-Boat Association, Power Squadron and several other organizations devoted to the sport will be on hand to help the sport in every possible way.

The show comes this year in what might be termed the cycle of automotive exhibitions. The automobile exhibition opened on January 6th. The power-boat show opens on January 27th, and the aeronautic exhibition will open on February 8th. These three big exhibitions are all closely allied for in each unit of the cycle the gasolene engine is used as the motive power.

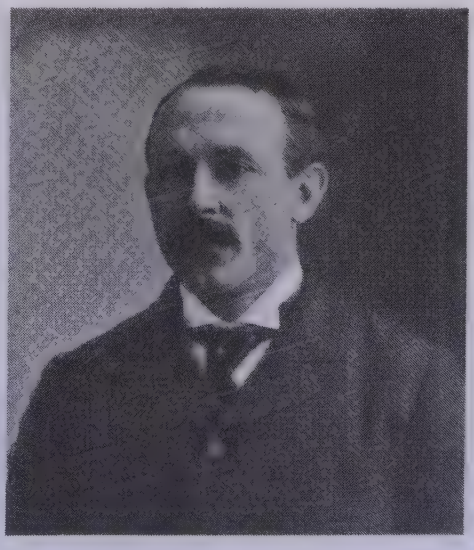
Like many other progressive measures the National Association of Engine and Boat Manufacturers originated in THE RUDDER office. Until 1903 there had been a few exhibits of gas engines and of power boats in the annual Sportsmen's Show, held in the Madison Square Garden, and the exhibitions of 1903 and 1904 were made particularly attractive to yachtsmen because of the display of boats. Some of the boat and engine builders were approached by E. W. Graef, who was then on the staff of THE RUDDER, with the idea of forming an association which should look after the interests of the new industry and Mr. Graef sent out a letter to all with the result that a meeting was held and action taken on the formation of a national association. This meeting led to another letter being issued, which was signed by John J. Amory, H. A. Lozier, Jr., J. N. Schoonmaker, J. S. Bunting, representing Smith & Mabley, H. N. Whittlesey and E. W. Graef, and the association was incorporated with these gentlemen as directors on May 24, 1906, and on June 6th the first meeting of this association was held in the Manhattan Hotel. John J. Amory was elected president, H. A. Lozier, Jr., first vice-president, J. N. Schoonmaker second vice-president, H. R. Sutphen third vice-president, and J. S. Bunting treasurer. The objects of the association as set forth in the constitution are "to protect, promote, further and advance the interests of the members, as manufacturers and sellers of engines, motors and boats of every kind and description, and accessories thereto, and as journalists devoted in all or in part to the interests of engines, motors and boats and allied and kindred industries."

Just how this association has grown is known to all interested in boats or engines and its members extend from coast to coast. Of the original members there are still on the list, John J. Amory, of the Gas Engine & Power Company; Lewis Audenried, of the Pennsylvania Iron Works; James Craig, H. D. Doman, Walter L. Fay, of Fay & Bowen, George E. Hammann, of The Standard Company, The Matthews Boat Company, W. H. Mullins, John A. Murray, of Murray & Tregurtha, Buffalo Gasoline Motor Company, C. L. Snyder, of the Wolverine Motor Works, Henry R. Sutphen, of the Elco Company, H. L. Aldrich, of American Engineering, the Carlyle-Johnson Machine Company, Tams, Lemoine & Crane, C. D. Durkee, Hess-Bright Manufacturing Company, the Edison Manufacturing Company, THE RUDDER, *Motor Boat*, A. B. Sands & Co., and the Splitdorf Electrical Company, and a few others.

At the 1904 show under the auspices of the Sportsmen's Show, such boats as the Dolphin, Standard and Adios were exhibited. The Dolphin was the original V-bottom boat, and was designed by E. W. Graef, and from that Dolphin has developed the V-bottom boat of today.

The association entered into a contract with the Madison Square Garden Company to combine the power-boat show each year with the Sportsmen's Show, and in a few years the power boats and engines proved to be the strongest attraction. In those days there was a tank in the Garden. The Electric Launch Company sent one of its electric boats which was named Buster Brown, and it used to carry passengers around a small island in the lake for 10 cents a head, and it did a thriving business. In those early days the Gas Engine Company displayed a 32-foot speed-boat for which 19 miles an hour was claimed, while one of the first of the Electric Launch boats was fitted with a Panhard engine and could make 17½ miles.

How things have progressed! A mile-a-minute boat is to be shown at the show this year, Miss Minneapolis, winner of last year's Gold Cup, and now having developed the mile-a-minute boat, the speed fans are look-



James Craig, Who Watches the Treasury With Scotch Shrewdness

ing for still greater speed. Two-cylinder engines have developed into twin-six engines, and what thirteen years ago were dreamed of by what were termed fanatics in the way of development, have been far exceeded in reality. The gas engine, instead of being a toy, used by a few men of wealth, has become a reliable engine without which it is difficult to understand how the world moved. Now we have cruisers capable of 40 miles an hour. Torpedo-boats are being equipped with gas engines and one built for the Government by the Greenport Basin & Construction Company which will be on exhibition is guaranteed to make 41 miles an hour. Big power yachts have been constructed with engines that will carry them across the ocean and that, too, without using up all the fuel with which they started. The gas engine has been placed in the vessel of commerce and it is only a question of time when it will drive away all the picturesque old sailing craft and not only the big vessel itself will be driven by gas engines, but all its equipment of boats will have smaller engines.

For pleasure craft the gas engine has turned the sailing yacht into an auxiliary. Now a yachtsman can race when he wishes to under sail and when the wind fails he can get back to port under power. The old-time houseboat was towed from one anchorage to another. The modern houseboat is equipped with gasolene engines and can navigate from one port to another just as a steam vessel does.

John J. Amory, the first president, is still president of the National Association. He has been an able leader and his careful conservative judgment in many matters of vital importance has enabled the association to weather many storms. Henry R. Sutphen is first vice-president, and he has been chairman of the exhibition committee since 1904. Mr. Sutphen has worked hard for the association and for the shows, and the dividends that have been returned to the members, for the show is really a co-operative affair, is evidence of his success. James Craig followed Mr. Bunting as treasurer, and he, too, has devoted much of his time in the interests of the association.

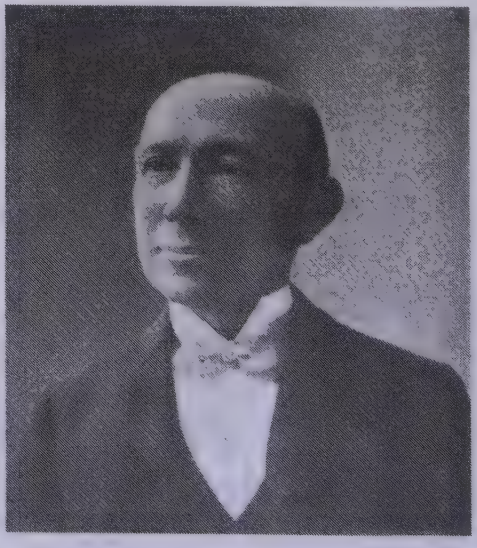
Ira Hand, known from one end of the trade to the other, was made secretary in January, 1910. In 1912 the association decided to stand alone. It had practically carried the Sportsmen's Show along and realized that it was time that there should be a show each year exclusively for boats, engines and accessories, and that all benefits should go to the association. Since 1912 there has been a show each year in New York, and there have been two shows in Chicago and one in Boston under the auspices of the Association. Mr. Ira Hand, who as secretary is practically manager, soon showed that he was an expert at the show business, and the annual exhibition grew wonderfully fast. Mr. Hand, too, is very much of a diplomat and although he has to listen to many strenuous kicks around show time from exhibitors, he invariably succeeds in smoothing over all troubles and many a man who has gone to him with some grievance has left later realizing that he has really been well treated and has got more than he is entitled to.

The present officers of the National Association are: President, John J. Amory; first vice-president, Henry R. Sutphen; second vice-president, Percy C. Jones; third vice-president, Charles A. Criqui; treasurer, James Craig; secretary, Ira Hand. Executive Committee: John J. Amory, chairman; Class 1918, John J. Amory, Walter L. Fay, Arthur W. Toppan, George F. Lawley; Class 1917, P. C. Jones, Henry R. Sutphen, A. E. Robinson, H. H. Brautigam, Charles A. Criqui; Class 1916, C. L. Snyder, James Craig, Ora J. Mulford, Crispin Oglebay, W. H. Mullins.

The annual meeting will be held on Thursday, February 8th, and all the members of Class 1916 have been



Ira Hand, the Diplomatic Secretary



George F. Lawley, Legislation and Exhibition Committees



H. H. Brautigam, Exhibition and Transportation Committees



Crispin Oglebay, Exhibition Committee

renominated with the exception of Crispin Oglebay, whose place on the regular ticket has been taken by J. W. C. Van Blerck.

The exhibition committee this year is: Henry R. Sutphen, chairman, James Craig, George F. Lawley, Crispin Oglebay and H. H. Brautigam.

The other committees are: Advertising—Ora J. Mulford, chairman, James Craig, Walter L. Fay, Henry R. Sutphen, Charles A. Criqui; Legislation—George F. Lawley, chairman, Walter L. Fay, Charles A. Criqui, Ora J. Mulford, P. C. Jones; Technical—James Craig, chairman, Arthur W. Toppan, George F. Lawley, C. L. Snyder, A. E. Robinson; Transportation—H. H. Brautigam, chairman, C. L. Snyder, P. C. Jones, A. W. Toppan, W. H. Mullins.



Ogden M. Reid's Power Yacht, Porpoise. Built by Oscar Anderson, and Driven by a 4-Cyl., 6½-In. x 7-In. Clifton Engine

Power-Boat Basins Along Interstate Park

By Charles A. Starr

WHEN George W. Perkins was resting from the political campaign, and from the development of Bear Mountain as a people's outing place, and from building an automobile road to make it accessible, and from running a boat line along the Palisades for those who didn't own a boat themselves, and from a multitude of other duties, public and private—while he was *resting*, I say—he occupied himself seeking ways to make the Palisades Interstate Park available to the Hudson River power-boat owners.

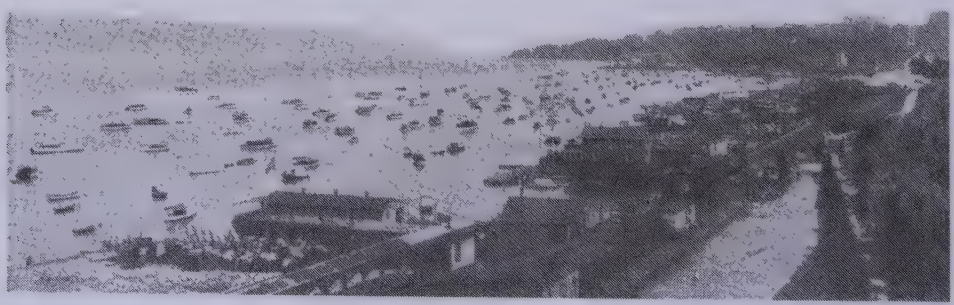
Now, of course, you will say at once that raised deck boats and runabouts and express cruisers do not customarily invade the precincts of a park. Granted. But they have, and increasingly they will, and when the great company of "bugs" who navigate the Hudson learn what Mr. Perkins has done for them, they will bless him and his associates on the Interstate Park Commission and the legislators who made it possible for these gentlemen to become benefactors of the amateur boatmen. For, be it known, and I guess this is the first time the fact has been printed, they have built several power-boat basins along the park. It is significant that, when the Manhattan park commissioner has been doing his best to drive the power boats from the anchorages along the Manhattan shore, the Interstate Park commissioners have been trying to attract them.

Oh, you knew that there was a basin at Alpine and another at Forest View, did you? Perhaps you knew about the latest thing in basins at Englewood Landing, just across from Dyckman Street, also. Quite a few of the "bugs" discovered it, without any press agenting, I know, and they were as busy as naval scouts in spreading the news among the clubs; but it remains a fact, still, that but a small percentage of the craft found it out as they sped by on the way to Croton Point, or hurried home from the week-end outing. It was so near home most of them never found it.

Probably there is no basin in the East so perfectly appointed as the new one at Englewood Landing. It is modeled after the basin of one of the swellest of the Chicago yacht clubs; out there where no natural harbors are to be found, each club must have a protected anchorage, for the lake kicks up an awful muss at times. If you saw the Hudson during one of the big blows of the past season, you know that our own North River, where it widens enough to give the wind a chance, can do some lively tumbling, also. There is not a harbor South of Croton Point, at which place you can anchor on the North side or the South side, according to the way the wind is blowing; and there is nothing for the small boat to do but hug the shore and scoot along as best it can. Even the club anchorages are exposed and anyone who has tried sleeping in anything less than a 40-footer knows that it is an uncomfortable experience.

Now there is to be a new way and a comfortable way of living on the water in the shadow of the city, convenient to other transportation if it is stormy and as quiet as the Harlem Mere. It will be possible for many a cruiser owner to close up the flat, store the furniture and live aboard all Summer, without the surety of being shaken up by every breeze or by the swells from the procession of night boats and day boats and excursion steamers. For a trifling sum it will be possible to rent a mooring stall at Englewood Landing for the Summer and commute to the club landing just as the Wall Street men commute from the Sound. Or you can leave the wife and kiddies in care of the park policemen and cross the ferry to the subway and get to business on time.

The new basin at Englewood Landing is unique in one respect; there are stalls for the boats. You run into the basin through an ample gateway, turn behind the breakwater and take your choice of any stall unoccupied and not reserved for a renter. As you nose into the slip —stall is the name—there are conveniences for making fast and if your mahogany planking or paint will not stand friction, you can tie up so that she will swing free of all posts. Alongside the boat you will find a walk or platform with railing, leading to a broader walk along the



View of the Hudson Between 142d and 153d Streets, Showing the Need of Yacht Basins for the Protection of This Large Fleet of Power Boats

breakwater, just beyond the stem of your boat. Probably you will find a policeman standing on this walk waiting to help you moor, if you are single-handed.

Right here I want to digress to say a few things about the park cops. I don't know where Mr. Perkins succeeded in finding such men, but really they seem glad you came and try to make you feel at home from the start; and they help you tie up, or cast off, or shove the boat out of the slip, and turn it around as though they were paid for it, and you couldn't slip one of them a half, or a two-spot, or even a smoke, for they will tell you they are only doing what they are paid to do, and what they are glad to do. You simply cannot escape them, for they seem to be playing the glad game everywhere.

The basin is 1,100 feet long and 150 feet wide, the shore edge being too shallow for all but small boats and canoes, but except for this small rim of beach there is a minimum depth of six feet, enough for any power boat on the river. The stalls at present built are 15 feet long by 8 feet wide, which is not wide enough for the large boats, and they must anchor, but there is room for another row of stalls for the larger craft and it is expected that these will be put up early in the Spring. There are forty stalls now, and with thirty for large boats and anchorage space for twice as many more by using bow and stern anchors, it will be possible for quite a large fleet to be accommodated at one time.

Just above the Dyckman ferry slip at the Landing is a five-acre plot of filled ground, on which there will be a lawn next year. The power-boat basin comes next, and beyond this is another plot of filled ground of four acres, which is to be put in grass also. Opposite the entrance to the basin is a small beach, known as Canoe Beach, and power craft must keep clear of that; those who desire to go there to swim can walk around or go by dinghy. At either end of the basin is a building intended to house lunch rooms and other picnic ground necessities, and one of the strange things about this arrangement is that the commission plans to put in what the boatmen want and enlarge according to demand.

There is fine water handy, cool from the spring, that invariably will make you sing of "The Old Oaken Bucket," and when next Summer a band gives concerts on the green near the basin and you sit tranquil and watch the shadows of the Palisades lengthen, you will want to lift your cap toward the hills across the river,



Englewood Landing Basin, With Stalls Built for Power Boats



Steamboat Landing at Bear Mountain and Landings for Small Power Boats

Riverdale way, where Mr. Perkins sometimes is able to sleep, in acknowledgment of his kindly offices.

To make the basin more accessible, it is understood that the Union Railway will extend its line, if permitted, through Dyckman Street to the ferry landing, and that the Public Service Company will extend its Fort Lee line to Palisade Avenue, on top of the hill above the basin and reached by the new auto road built by the park commissioners.

Englewood is just two miles West of the new basin, and it is expected that a number of residents there will take advantage of the facilities, for they will not have to join a club, though having about all the privileges and conveniences of a club, at much less expense.

Summer convenience is not all that is contemplated, for at several points along the park there are suitable spaces for Winter storage and if there is a demand a marine railway will be put in to handle boats. Also the heavier built boats, able to stand the combination of tide and ice through the closed season, will find it possible already to rent a stall at Englewood Landing at nominal cost. The police force is maintained so that safety is assured.

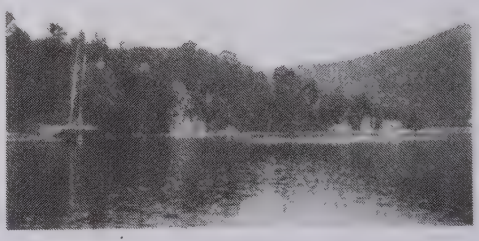
Already there are basins at Alpine and Forest View Landings, smaller in extent and without stalls, but of sufficient size to shelter a large number of boats and the T-ends of the piers give protection against the swells and Easterly winds. There the proper thing is to nose in to the pier, make fast and drop a stern anchor to keep from swinging against one's neighbor.

The commission plans, however, to put in at Alpine another basin as large or larger than that at Englewood Landing, with larger stalls and other conveniences. Plans are being considered now for this basin and the only thing to prevent its completion will be lack of money. This does not seem a serious obstacle when one is familiar with the vast amount of work done on a surprisingly small income. Happily the income of the park from privileges now goes back into the maintenance and development fund, so you may know that the small sum you are asked to pay for the new boat accommodations will be spent to devise new means to make you more comfortable. So far no charge has been made for week-end use of the basins; contemplated charges will be for more permanent use of the facilities.

The development of the power-boat basins depends largely upon the demand for them and appreciation of their establishment. I know a number of boat owners



Fort Cornwallis, at Alpine Landing. Used During the Revolutionary War



Popolopen Creek, Near the High Bridge. A Good Anchorage for Pair-Sized Boats

who found it very convenient to run to one of the basins in the late afternoon during the season, have supper aboard, and then come home in the cool of the evening, rested and refreshed, and they had not been out of sight of the city at any time. Others were able to spend the night aboard and return after breakfast, in time to get to business.

Another point where a basin has been provided is at Bear Mountain Landing, where the steamboat piers are utilized to form a shelter which is nearly as good as those at Alpine and Forest View. But there is, for those who desire to spend the night that far up the river, one of the most perfect harbors to be found on the Hudson, namely Popolopen Creek, just above the landing. The West Shore tracks cross the entrance, but practically any power boat can enter by dropping the masts, and if demanded the draw can be opened. Of late there has been so little demand for its use that rust has nearly "frozen" the machinery which operates it. The creek makes a gap in the hills which frown down upon it from either hand, and it is perfectly sheltered. The water is deep enough for the largest boats and there is room for the entire Hudson fleet and a large number of visitors.

One of the next steps will be to provide places to obtain ice and stores for the boats. The Bear Mountain Inn offers its famous dollar dinner for those who would escape the labor of preparing a meal, and all about there are delights for the eye, comforts and conveniences, and it is fairly certain that once the "bugs" are aware of the harbor, at least for the larger cruising class, it will exceed in popularity Croton Point, which for several years has been the goal—the ambition—of the "bugs."

Hudson River Yachtsmen Anxious

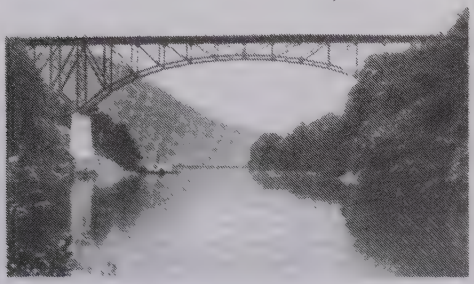
SHOULD one of the plans under consideration by the Board of Estimate and Apportionment of the City of New York be adopted several hundred yachtsmen, owners of power and sailing craft, will be driven away from the city and will have their pleasures sadly curtailed. Improvements are projected on the Hudson River waterfront, where many clubs whose members are devoted to yachting have their homes. As a sop to these yachtsmen it has been proposed that the city build a basin and allow the clubmen to have small houses around this basin, but that plan is not broad enough and the yachtsmen are not satisfied.

The members of these clubs have formed a Yachtsmen's Protective Association, of which Carl Reinschild is chairman. At a meeting of that association recently it was decided to submit a report to the general public, in order that it may judge of the merits and adaptability of two plans concerning the city's caretaking of the boating interests on the Hudson River, which are now under consideration by the city officials. Either plan adopted will supplement the pending agreement between the city of New York and the New York Central Railroad. This report says:

"The first plan worked out by the Dock Department embodies a reservation for all the boating interests, yachts, power boats, rowboats and canoes, between 142d and 153d Streets, on the Hudson River, by a recession of the bulkhead line, which will not only offer safe anchorage against the strong tides and winds, but will beautify the shore with a marginal way along it for the erection of uniform and ornamental clubhouses, furnishing access for pedestrians, deliveries and automobiles. This plan will take care of all clubs, boats, yachts, and is passed upon as desirable and adequate by the thousands of interested citizens, who find their recreation and healthy occupation in their hobby and pursuit.

"All other cities in the East vie with each other to protect and support the lovers of water sports, like Boston, Albany, Hartford, New Haven, New London, etc., and New York City alone contemplates driving the most attractive ornament of our beautiful Hudson River beyond the city limits.

"Considering that the city provides grounds and improvements for all other lovers of out-door recreation, a speedway for trotting horses, a pathway in Central, Bronx and Riverside Parks for riding horses, grounds in all Public Parks for golf, tennis and baseball; special improved roads for cyclists and automobilists, it seems that any agreement which does not provide for adequate ground for the lovers of water sport is a gross and un-



Looking Towards the Hudson



Looking Towards Bear Mountain

TWO VIEWS OF POPOLOPEN CREEK

pardonable injustice and should not find the support of citizens, who are proud of their magnificent Hudson River.

"Just such injustice would be done if the second plan submitted by the Park Department is at all considered, for this plan provides a small basin, not large enough to hold one-tenth of the number of boats now seeking shelter and accommodation, nor making any provisions for the clubhouses and access thereto.

"It seems quite excusable that a department which never had any jurisdiction over marine matters should err, especially when swayed by an entirely worthy sentiment in behalf of our children, trying to obtain the grounds which have given shelter and homes for the boating interests and turning them into children's playgrounds.

"The Park Department unfortunately loses sight of two important things:

"First, that there is plenty of land available for children's recreation grounds, whereas boats cannot be manipulated on land and have only one river at their disposal, and second, that if the city would insist upon having the contemplated, noisy, ill-smelling and unsightly freight yards covered with a concrete structure, that this will afford better and more accessible playgrounds for the children, than the low land bordering on the water, where quite often the air is contaminated through sewers ending right there.

"The thousands of water-loving citizens who have their interest centered and vast amount of money invested in boats, realize that there is not another strip of land on the Hudson available for their needs.

"They have spent their moneys in the improvements and maintenance and therefore pray for the active support of all well-meaning citizens to exert their influence in behalf of the only practical and adequate plan submitted, the plan of the Dock Department."

The Fort Hamilton Basins

LAST Spring THE RUDDER called attention to the needs of the yachtsmen on the Lower Bay. From 65th Street to Fort Hamilton there is now a stone wall without a harbor except the basin of the Crescent A. C. at 84th Street. It was suggested by George V. Brower, that a basin be built at Fort Hamilton, and the suggestion was referred to Park Commissioner Raymond V. Ingersoll. Mr. Ingersoll heartily endorsed the scheme and had plans drawn and an estimate of cost furnished. He has now made application to the Board of Estimate and Apportionment for an appropriation sufficient to enable the construction of small basins along the Shore Drive at Bay Ridge to afford safe anchorages for small boats. THE RUDDER notified the commodores of all the clubs on the Lower Bay of the Commissioner's action and urged that they should appoint committees to wait on members of the board and to urge members of their clubs to write to members of the board. Commodore Biddle, of the Marine and Field Club, has been very active in this matter, and has sent letters to all yachtsmen interested. In this letter he says:

"You will appreciate that unless basins are constructed there will be several miles of stone wall along the Bay Ridge shore which will prove very dangerous to sailing yachts during rough weather, and to power boats that may have any engine trouble.

"The question of an appropriation for this purpose is now under consideration by the Budget Committee of the Board of Estimate and Apportionment, consisting of the following: Hon. John Purroy Mitchel, Mayor, City Hall; Hon. William A. Prendergast, Comptroller, Municipal Building; Hon. Douglas Mathewson, President of the Borough of Bronx, Third Avenue and 177th Street, New York City; Hon. Lewis H. Pounds, President of the Borough of Brooklyn, Borough Hall, Brooklyn, N. Y.; Hon. Frank L. Dowling, President of the Board of Aldermen, City Hall.

"Will you please write to every member of this committee, urging them to grant the application of Park Commissioner Ingersoll? The members of the yacht clubs in Gravesend Bay who are members of the Yacht Racing Association of Gravesend Bay will be the principal ones to enjoy the advantages of these basins when constructed."

Outlook in Southern New Jersey

By J. Kinzer Shell, Jr.

THE yachting outlook for 1917 in the section comprising the Delaware River, the South Jersey and the shores of Barnegat Bay, is exceedingly bright judging by the way the designers and boatbuilders are working overtime to get out orders. Added to this general increase in boatbuilding is the enlarging of present boats, and the reconstruction of quite a few of the racing boats in preparation for the coming racing season. At the present time the three yacht associations have gotten down to business and are making rapid progress in arranging for racing events this coming Summer.

What will tend to increase the game and keep it on a par with the many other Summer sports is the ever-increasing demand for co-operation by the yachtsmen and power-boatists interested in the sport. Since two years ago, when four of the clubs holding membership in the Delaware River Y. R. A. resigned and formed what is now known as the Delaware River Yachtsmen's League, the yachtsmen interested in the sport realized what the break would mean after a time and have endeavored to fix up matters. At a recent meeting of the Delaware River Y. R. A., Vice-President William Kirk suggested the amalgamation of the hundred or more clubs in the Delaware River section for the betterment of the sport. Since that meeting progress has been made, the League officials are awake to the possibilities and are willing to co-operate with the Association. The result will be the coming in of the South Jersey and the Barnegat Bay organizations, all working together for the good of the sport.

Practically every one of the clubs in the three sections has held its annual election and schedules are being arranged. No doubt when final announcement is made of the various schedules it will be found that more than 150 events have been arranged. Every yacht-building plant is working overtime to get the orders out in time, and do the repair work necessary for the getting over of the boats which figured prominently in the racing game last season.

John B. Kirk, of Toms River, N. J., has just finished two duckers for George W. Childs Drexel, of Philadelphia, for use this Winter in Florida. Kirk is also building a 30-foot runabout, designed by Morris M. Whitaker, for Captain Clarence Birdsall, of Toms River, N. J., and a 35-foot cabin cruiser, designed by himself for Mr. Stoutenberg, of New York.

The South Jersey Yacht Building Company, of Atlantic City, has an extra force working on new orders and repair work. The firm of Adolph E. Apel, of Ventnor Heights, is also busy with work, as is Stanley C. Vansant, of the same resort. All along the Jersey Coast, especially on Barnegat Bay and the lower section, the yards are working hard on orders for catboats and sneakboxes.

The Mathis Yacht Building Company, of Camden, N. J., reports the following boats building for this Summer: A 72-foot houseboat for A. P. Ordway, of New York; an 80-foot houseboat for James Deering, of Chicago; a 106-foot houseboat for L. H. and A. W. Armour, of Chicago, and a 106-foot houseboat for Murray Guggenheim, of New York.

The many other yacht-building plants on the Delaware River are working overtime, especially William Steel, of Delanco, the Essington Ship Building Company, and several plants around Wilmington, Del., and Salisbury, Md.

Bowes & Mower, the Philadalphia naval architects, are rushed with orders, some of which are:

A 152-foot steel power yacht for a member of the New York Y. C., which will be equipped with two 300-h.p. Diesel engines.

An 84-foot power cruiser of the destroyer type, which will be powered with two 125-h.p. engines.

An 88-foot flush deck, three-masted, auxiliary schooner building at the yard of Hodgdon Brothers, East Boothbay, Me., for Frank B. Bower, a member of the Corinthian Y. C., of Philadelphia. She will be equipped with a six-cylinder, 80-h.p. engine of the heavy-duty type.

A 70-foot shoal-draught houseboat for T. Elwood Allison, of Wallingford, Pa., which will be built in the South.

A 55-foot express cruiser for Charles H. Ludington, of



Elf, Built by Stanley C. Vansant. Speed, 22 Miles, With Two 6-Cyl., 150-H.P. Van Blercks

Ardmore, Pa. She will have a speed of 20 miles per hour, and will be used on the Maine Coast this coming season.

A 21-foot runabout for William P. Trench, of New York.

An interesting auxiliary yawl has been designed for G. B. Hennings, to be used at Na Ba Vatu, Fiji Islands, where she is now under construction.

This firm also has quite a large amount of commercial work, which includes a 130-foot oceangoing tug for the Dilkes Steamship Company, of Philadelphia, and several 3,100-ton barges for the Hutchinson Coal Company, also of Philadelphia, which will be built in Southern yards; a 94-foot power lighter, which is now in frame at the yard of the McLean Contracting Company, of Fort McHenry, Baltimore, Md., and will be equipped with two 45-h.p. Fairbanks-Morse oil engines. She will be used by her owners in Costa Rica, where they have extensive lumber interests.

The 40-foot express cruiser Aztec, for George W. Childs Drexel, is now practically completed at the yard of John C. Vanderslice, of Camden, N. J. She will be equipped with two six-cylinder, 60-h.p. Loew-Victor engines. Mr. Drexel will use the Aztec in Southern waters this Winter. A 30-foot runabout for Mr. Drexel's use in Maine is building.

A 41-foot express cruiser, similar to the Allegria, which was designed for John E. Zimmerman, and used on the Maine Coast last season, is being built by the Burger Boat Company, of Manitowoc, Wis.

At the Mathis Yacht Building Company the express cruiser Ameera, for Alexander Sellers, of Philadelphia, and the scout patrol boat for Commodore Charles Longstreth, of the Corinthian Y. C., of Philadelphia, are ready for trials.

The Elf, which is now on her way South, was designed for Louis H. Eisenlohr, of Philadelphia, and built at the yard of Stanley C. Vansant, of Atlantic City, N. J. She is an interesting type of express cruiser, and is 51 feet long, 12 feet breadth and is powered with two six-cylinder, 150-h.p. Van Blerck engines. This boat has accommodations for a large party, which includes a roomy cabin, staterooms and galley equipped with an electric refrigerating plant, a toilet room aft equipped with an electrically-controlled shower-bath. Notwithstanding all these comforts, the Elf will make 22 statute miles per hour, which is in excess of the speed guaranteed by the architects.

J. Murray Watts, of Philadelphia, reports the following orders:

A cruising yacht for J. Percy Bartram, of New York, 110 feet long, 21 feet breadth, 5 feet 8 inches draught, building at the yard of George Lawley & Son Corporation, driven by two 160-h.p. Speedway engines, to be christened Consuelo, and used for coastwise cruising.

The Kiva, a cruiser for Dr. Frank Landon Humphreys, of New York, 87 feet long, 17 feet breadth and 4 feet 6 inches draught, powered with two heavy-duty, six-cylinder Sterling engines, building at the yard of the Smith & Williams Company, Salisbury, Md.

A 110-foot seagoing cruiser for William B. Hurlburt, of New York City, driven by two 200-h.p. Sterling engines.

Muirmaid V, a 60-foot naval patrol scout type cruiser, for Pierre A. Proal, of Red Bank, N. J., building at the Red Bank Yacht Building Company, powered with an eight-cylinder, 200-h.p. Model F Sterling engine.

Otis H. Cutler, of New York, has ordered a 60-foot patrol scout type of cruiser, named the Merry Sunshine. The boat, which is building at the Smith & Williams Company, Salisbury, Md., will be driven by two six-cylinder, 150-h.p. Model F Sterling engines.

A 55-foot over-all length patrol scout type of cruiser named Nancy for Felton Bent, of Philadelphia, building at the plant of John C. Vanderslice, of Camden, N. J., powered with an eight-cylinder Model F, 200-h.p. Sterling engine.

William Freihofer, of Philadelphia, to have a 50-foot houseboat cruiser built with 14 feet breadth, 3 feet draught, at the yard of J. H. Wiggins, of Delair, N. J., to be propelled with a 70-h.p., heavy-duty Sterling engine.

A 40-foot express cruiser for Albert Aschaffenburg, of New Orleans, fitted with a 100-h.p. Van Blerck engine.

A 55-foot by 16-foot racing schooner yacht for Roger Young, of Newark, N. J.

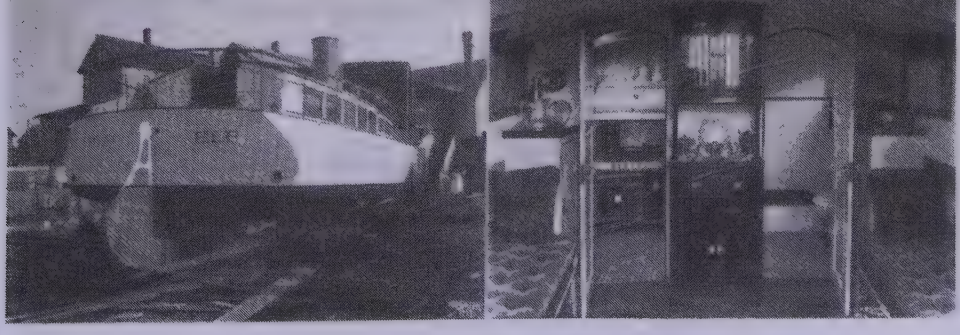
A 46-foot cruiser named Pythagoras for E. Paul Du Pont, of Wilmington, building at the Wilmington Yacht & Boat Works. The cruiser will be fitted with two four-cylinder, 36-h.p. Peerless engines.

Curlew, a 39-foot cruiser, building for Captain S. W. Jones, of Cleveland, Ohio, by E. M. Mohrman; a heavy-duty Goeth engine will be installed.

J. E. Whitehall, of Camden, N. J., is building for Clifton Kain, of Camden, N. J., the 38-foot cruiser Adventuress, in which an 18-h.p. Lathrop engine will be installed.

Work has been started on the Marymaid, for Mrs. Mary E. Fansler, of New York, at the yard of Smith & Williams Company, Salisbury, Md. The boat is 50 feet in over-all length with 16 feet breadth and will be powered with a 9-inch by 10-inch 50-h.p. Kahlenberg engine.

A 63-foot cruiser for A. A. Schantz, of Detroit, Mich., is now being figured on by the American Boat Company. She will be fitted with an eight-cylinder Van Blerck engine and is practically a duplicate of the 57-foot by 9-foot cruiser Loleta, just completed for A. H. Schmidt, of Detroit.



Stern and Interior Views of the Elf. Built for Louis H. Eisenlohr. Designed by Bowes & Mower

Auxiliary Power for Sailing Vessels

A Practical Aspect of the Situation

PART II—(*Concluded*)

BEFORE probing the question of small auxiliary traders, reference must be made to La France, because she is the largest power-driven sailing ship in the world, and is a typical example of how even a huge vessel of this class can be most successful on a properly selected route. La France is engaged in the ore-carrying trade between an island in the Pacific Ocean and the French Coast. She is 430 feet long by 57 feet breadth, with 24 feet draught, and carries 70,000 square feet of sail. With a wind velocity of 3 meters per second she has a speed of 17 knots, or 19½ miles an hour. Her d.w.c. is about 10,500 tons. Her auxiliary power consists of two 900-h.p. at 230 r.p.m., heavy-oil engines, which give her a speed of 10.3 knots under power alone, and occupy a space 22 feet long at the after end of the hull. On that route she has advantage of the trade winds for sailing and when crossing the doldrums and other calm stretches, can make quite a good speed under power alone. As she has to return almost in ballast, it can easily be seen that this is a case where a steamer could not possibly compete on the same route. Probably it would not pay to run a steamer at all, but that depends upon the rates obtainable for freight.

Some interesting figures are available regarding the newly converted auxiliary Annie Johnson, which started on her maiden voyage to Honolulu from San Francisco, in April last, arriving there in eleven days with 1,700 tons of cargo, having averaged 204.8 sea-miles per day, or 8½ knots average speed. Her return voyage to 'Frisco, with 2,000 tons of sugar aboard, was made in fifteen days, the engines being used the whole distance, due to unfavorable sailing weather, head winds, or calms prevailing the whole time. In fact, the Falls of Clyde, a four-masted sailing ship owned by the Associated Oil Company, was thirty-seven days out of Honolulu, and the schooner Beulah nineteen days out when the Annie Johnson arrived, while the bark R. P. Rithet occupied twenty-eight days. In connection with this, an important official of the Associated Oil Company said that they are seriously considering converting the Falls of Clyde and her sister ship, the Marion Chilcott, to auxiliary oil-engine power.

On the outward voyage just referred to the Annie Johnson used 105 barrels of oil-fuel (42 gallons to the barrel). On the homeward voyage, her total consumption was 289 barrels (12,138 gallons of fuel, and 400 gallons of lubricating oil). The total fuel and oil bills for the return trip being within $470.

Annie Johnson is an iron ship of the fine old type, having been built in England in 1872. She is 212 feet long, 34 feet breadth and 21½ feet depth, and of 1,049 gross tonnage. Two 160-b.h.p. oil engines drive propellers 6 feet diameter by 4 feet 1½ inches pitch at 225 r.p.m. It will easily be realized that the advantages of her newly installed auxiliary power are enormous. Her owners are the Matson Navigation Company, and they are having several similar vessels built. On the Pacific Coast dozens of auxiliary-power sailing ships have been ordered, and it is significant that in nearly every instance heavy-oil engines will be installed. Most of these craft will be engaged in the lumber trade.

An argument in favor of the auxiliary can be found any day at the Western end of Long Island Sound. Sailing vessels pass nearly always in tow of a tug. Some have auxiliary motive power, and others are content to wait for and drift with the tides if becalmed, or if an unfavorable wind; and in Summer time the section of the Sound referred to does not usually get much breeze before evening. In any event it is narrow and does not offer much room for tacking. These ships are mostly craft of from 100 to 800 tons d.w.c. Some reliable data regarding craft of these sizes that are in service have been obtained and the approximate costs of operation under power are given herewith.

First, take an auxiliary ketch of 180 tons d.w.c., with the following dimensions: Length 92 feet, breadth 23 feet, draught 8½ feet. A slow-speed, heavy-duty engine of 35 b.h.p. will drive her at 6 knots, with the sails furled, in slack water. An installation of this power will take up but very little room, so will hardly affect the carrying capacity, while the cost will be moderate, and it is up to the owner to have one of three kinds of internal-combustion engines, namely, gasolene, kerosene, or heavy-oil. In either event, a man will be required to attend to the machinery, and as has been pointed out in the previous article, the engine deserves to be operated by a mechanic, by reason of its resultant great economies and because the eventual maintenance costs will be lowered and better reliability given. This engineer is by no means essential with such moderate power; but it is a sound business policy to adopt. A ship owner knows that his office staff can look after themselves, but that a manager means greatly increased efficiency, and the cases are parallel. Parsimony with his ship or in his office means efficiency reduction. What it costs to operate the engine for this ship is made clear in the following table:

APPROXIMATE RUNNING EXPENSES OF A 35-H.P. ENGINE

	Heavy Oil	Kerosene	Gasolene
Cost of fuel per gallon	$0.05	$0.11	$0.25
Consumption of fuel per hour	2.50 gal.	4.36 gal.	4.36 gal.
Cost of fuel per hour	0.12½	0.48	1.09
Fuel consumption per 24 hours' operation	60 gal.	104½ gal.	104½ gal.
Cost of fuel per 24 hours' operation	3.00	11.52	26.16
Cost of lubricating oil per 24 hours' operation	1.00	1.00	1.00

To the above must be added depreciation, insurance, and the mechanic's wages; but against which are offset the better insurance and freightage rates that the ship is entitled to. These remarks also apply to all the following cases, and in this connection we notice that the American Bureau of Shipping has granted a 15-year highest rating to a number of auxiliary four-masted schooners building from designs by Cox & Stevens, of New York, which ensures reasonable rates of insurance.

In the particular instance of the 180-ton auxiliary above the captain can always be sure of logging 150 nautical miles in a day, and considerably more with a fair wind. Under sail alone she may not cover 10 miles, or she may sail 200 miles.

We know of another case where a three-masted schooner of 148 tons net, 258 tons register, and 420 tons d.w.c., increased her earning capacity by 20 to 35%, namely, by installing an auxiliary oil engine, despite the space occupied by her machinery. Her length is 128 feet by 25 feet breadth, and 13 feet depth of hold. A two-cylinder engine of 90 h.p. gives her a speed of 5 knots when loaded, or 5½ knots on her trials. Her operating costs are easily figured out:

APPROXIMATE RUNNING EXPENSES OF A 90-H.P. ENGINE

	Heavy Oil	Kerosene	Gasolene
Cost of fuel per gallon	$0.05	$0.11	$0.25
Consumption of fuel per hour	5¾ gal.	11 gal.	11 gal.
Cost of fuel per hour	.29	1.41	2.75
Fuel consumption per 24 hours' operation	138 gal.	264 gal.	264 gal.
Cost of fuel per 24 hours' operation	6.90	29.04	66.00
Cost of lubricating oil per 24 hours' operation	2.00	2.00	2.00

Should kerosene be used with the hot-bulb type of oil engine, the fuel bill will be about 6/10ths that of the electrical-ignition type of kerosene engine. This applies in all cases, because the comparison figures refer to the electrical-ignition type of engine that uses gasolene for starting and heating the vaporizer. The fuel consumption of the one is 0.55 lb per b.h.p. hour, compared with about 1.00 lb per b.h.p. hour. But the electrical-ignition type of kerosene engine is much cheaper to purchase and some are more economical than others.

A somewhat different proposition is that of a four-masted schooner of 890 tons displacement, now in service. Her d.w.c. tonnage is about 600 tons. Her length is 135 feet by 30 feet breadth and 12 feet moulded depth. Her heavy-oil engine is of 160 b.h.p., which gives her a loaded speed of 8 knots, or 12 knots with sails and with a good breeze astern. Now, under ordinary circumstances, this is very high power for auxiliary purposes with such a small ship, and by cutting away the masts, she would virtually become a full-powered vessel. Hence it will be understood to make her pay large dividends in normal times as an auxiliary ship, her route would have to be selected with some discrimination. In her engine room alone she would need two men and a boy, while in proportion to the cargo carried her fuel bill will be fairly high, as shown by the following:

APPROXIMATE RUNNING EXPENSES OF A 160-B.H.P. ENGINE

	Heavy Oil	Kerosene
Cost of fuel per gallon	$0.05	$0.11
Consumption of fuel per hour	10½ gal.	10½ gal.
Cost of fuel per hour	0.52½	1.15½
Fuel consumption per 24 hours' operation	252 gal.	252 gal.
Cost of fuel per 24 hours' operation	12.60	27.72
Cost of lubricating oil per 24 hours' operation	3.50	3.50

This, however, seems to be a case where the sails are auxiliary to the engine, instead of the machinery being auxiliary to the canvas, under which condition the scheme would work well and economically because, being practically a full-powered ship, the deck crew would be considerably reduced, particularly as she is schooner-rigged, and the sail area would not be very large. Also the vessel would compete with full-powered steamers and not with sailing vessels. Her possible average speed would secure good freight rates, and the fuel bill, even with the engine constantly at work, would not be too large to prevent her carrying cargo very cheaply. But it will be understood that such a vessel must be on a service where better than "sailing-ship rates" can be obtained, or else where she can be sure of obtaining a cargo almost every voyage, and not have to be laid-up waiting for freight, because one of the secrets of the success of an auxiliary or power-ship is the extra number of voyages that can be made in a year.

In cases where ship owners do not desire to go to the expense of a sufficiently high-powered installation, or have not sufficient confidence in auxiliary power, it doubtless would pay them to install just enough power to give the ship a speed of 4 to 5 knots when docking, in order that the assistance of a tug or tugs may be dispensed with, and to use this power solely for docking.

Structural alterations to the hull could be avoided by using a deck installation. There are several ways of using a deck-drive, but the most successful that we yet have seen is where the propeller shaft was carried down the side of the ship on a hinged spar, which can be lifted out of the water when not required.

Near the stern of the vessel the engine is arranged athwartships on deck, in a housing, and a shaft, having a universal joint at each end, transmits the drive to a bevel gear-box at the vessel's side, whence the propeller is let down into the water on the spar. The latter can be raised clear so will not interfere with the sailing qualities of the ship. This method has been used up to 45 h.p., but it is not generally recommended for larger powers, preferably smaller—say 3 to 25 h.p.

Ship owners who install auxiliary power for the first time will be most favorably surprised at the results if they instruct their skippers to maintain a sharp eye on the use of the engine. One firm instruct their captains only to use the engine when they cannot make reasonable speed under sail alone. As soon as the engine is started an entry is made in the log, with the approximate position of the ship at the time, and if land is in sight, the bearings also must be entered up. All the time power is being used, entries must be made showing the time at which



Kittie A. Fitted With a Kahlenberg Engine

the vessel passes prominent headlands, lights, etc. Then the owners can refer to the log, estimate the distance run, and check the amount of oil purchased and used, also make comparisons with voyages previously made without power. This careful attention has the effect of enabling voyages to be worked in the most economical manner. The skipper, knowing that the use of the engine is checked by the owner, exercises proper judgment and restraint.

It is significant that close upon fifty wooden schooners to be equipped with auxiliary motive power, are now under construction in various American yards, 80% of which are on the Pacific Coast. A number are also building in this country for Norwegian interests.

Some ship owners, however, are inclined to believe that it pays better to charter a tug at such times when a calm prevails. Even were this the case under normal conditions (which we much doubt) towage charges are now all out of proportion. There are no fixed charges for towing ships, but we have secured approximate figures from a towing company.

To tow a sailing craft of about 140 feet length from Providence, R. I., a distance of 130 sea-miles, approximately, would cost $150 to $200. Today, the charge would be anything from $200 to $350, unless the ship formed part of a string of boats. An auxiliary ship of this size would be driven at 6 knots if equipped with a heavy-duty, slow-speed engine of 100 b.h.p., so would take 20 hours, given favorable tides most of the way, and a dead calm throughout. To run the engine at full load for this period, would take under 140 gallons of heavy-oil at 5 cents per gallon, and about $2.00 worth of lubricating oil. That is to say, a total fuel cost of $9.00, to which have to be added the day's wages of the engineer and boy, and the share of depreciation, insurance and interest on the outlay. All of these would be included in another $15, so it will show an enormous saving to the auxiliary power.

To this criticism it might be pointed out that sailing vessels have been converted to full-power with good results, and another ship owner considered that many of the old wooden and steel sailing vessels are structurally stronger than some of the coasting steamers now in service, and could take considerable machinery with safety. Thus do owners' ideas differ.

Some interesting figures were given early in the year before the Committee on the Merchant Marine and Fisheries, in connection with the proposed "Shipping Bill," with reference to an order for six auxiliary steel schooners designed by Cox & Stevens, and placed with the Toledo Shipbuilding Company by the Smith Shipping Company, of New York. [Mr. R. Lawrence Smith, by the way, was in the real estate business, and is only a newcomer into the ship-owning game. Consequently he had no old-fashioned ideas to hinder him and quickly recognized the value of the auxiliary and the internal-combustion engine.] These ships are each 261 feet long, 43½ feet breadth, 23½ feet depth and 18 feet loaded draught, with a cargo capacity of 3,000 tons. The engines were supplied separately by the owners and cost $16,000 per set, or $40 per horsepower, and each boat has 400 b.h.p. This price is exceedingly low; in fact, the engine makers are now asking and obtaining in excess of $100 per b.h.p. The hull and work of installing the machinery was contracted for $225,000, with a bonus for quick delivery.

In their evidence the builders stated that they did not know the actual crew, but estimated the following:

Crew	Monthly Wages
1 Captain	$175
3 Mates (1 at $100; 2 at $80)	260
3 Quartermasters (at $35)	105
3 Engineers (1 at $125; 2 at $90)	305
3 Oilers (at $40)	120
9 Sailors (at $30)	270
5 Galleymen (1 at $50; 2 at $35; 2 at $25)	170
Total	$1,405

The estimated cost of operation of a wooden vessel of this type was filed before the committee, but the details are too numerous to repeat here. However, it was found that a voyage from Seattle to Sydney, Australia, with cargo, proceeding to Newcastle for another cargo and then returning to Seattle, Wash., would cost a total of $15,473. She earned $29,176 net, leaving a profit of $13,703 for the owners. The ship is 250 feet by 44 feet by 17 feet, and is powered with two 160-b.h.p. oil engines.

(The End)



55-Foot Express Cruiser Building for Joshua Crane, of Boston, by Britt Bros., from Designs of Swasey, Raymond & Page
To Be Driven by One 8-Cyl., 300-400-H.P. Duesenberg Engine

Steam Yacht Nokomis

NOKOMIS, a steam yacht built for Horace E. Dodge, of Detroit, was launched from the yards of the Pusey & Jones Company, at Wilmington, on Wednesday, December 27th. Nokomis is the largest yacht built in many years. She is to be completed and furnished some time this month and will then start off on a Southern cruise. Mrs. Dodge, wife of the owner, was sponsor for the new yacht and Mr. and Mrs. Dodge entertained a party of friends at the ceremony. Nokomis, when commissioned, will be the most up-to-date yacht afloat. She was built from designs by Gielow & Orr, and Henry J. Gielow has devoted much time on the plans and on the construction. When Mr. Dodge placed the order for his new yacht, which, by the way, is the second designed for him by Mr. Gielow, his instructions were that a thorough seagoing vessel, with all modern and up-to-date features, should be produced. In short, Nokomis was to be the last word in naval architecture and marine engineering.

The Nokomis has an over-all length of 243 feet, a water-line length of 203 feet. Her extreme breadth is 32 feet, her depth of hold 19 feet 6 inches and her mean draught 12 feet 10 inches. The hull is built of mild steel of from 60,000 to 58,000 lb tensile strength and practically equal to boiler plating, while parts of the engines are of nickel steel. The method of plating is in and out strakes, giving the strongest possible construction. No attempt has been made to economize in weight, the main object in view having been to produce a thoroughly substantial vessel capable of going out to sea in any weather. The lines of the yacht, while showing power, are very easy and extend in graceful curves from stem to stern. The sheer is graceful and the whole appearance of the hull clean cut and artistic.

The deck is flush and runs the full length of the vessel in an unbroken sweep. The bulwarks are of steel, finished with a mahogany rail. While no expense was spared to obtain the very best and highest grade of material for hull and machinery, equal care was also given to the interior joinerwork and to the decorations. The skylights and deck fittings are of solid mahogany, finished bright, and the saloon and staterooms are finished in mahogany and white enamel.

The deckhouse, which is of steel, is 140 feet in length and has 7 feet 4 inches headroom. It has a shade deck extending to the sides of the hull for its full length. At the after end there is a shelter hood, with glass panels, a divan, etc. All the owner's and guests' accommodations are in the after part of the vessel and the crew's quarters are forward. These accommodations are very commodious and the arrangement is most convenient for personal comforts. On the upper or boat deck there are two structures, one forward and one aft of the smokestack. The forward house is 28 feet long by 12 feet wide in the clear. The captain's stateroom is in the forward end of this house and is fitted with a large berth, wardrobe, divan and connects with a lavatory. Next aft is the wireless room of liberal dimensions which is arranged to hold all the apparatus and having liberal living accommodations for the operator. The after house is 32 feet long by 12 feet wide. The forward end, 21 feet, is fitted as a gymnasium and aft of this is a shelter hood with a cosy corner divan.

The dining room which is on the main deck and immediately forward of the engine space is 18 feet long and 20 feet wide. It has a buffet and sideboard at the forward end. The pantry is at the forward end on the starboard side, while on the port side are staterooms for



The S. Y. Nokomis. Built for Horace E. Dodge, from Designs by Gielow & Orr. 243 Ft. Long Over All. 203 Ft. W. L., 32 Ft. Breadth, 12 Ft. 10 In. Draught. Speed, 16¼ Knots

the stewards. Aft of the dining room on the starboard side is a vestibule with door leading on deck and aft of this is a lavatory and barber shop. Inboard of these is the engine room casing, while on the port side are two staterooms for the engineer and his assistants. Next is the ship's laundry, fitted with all modern machinery, which is operated by electricity. Aft of this is the boiler housing.

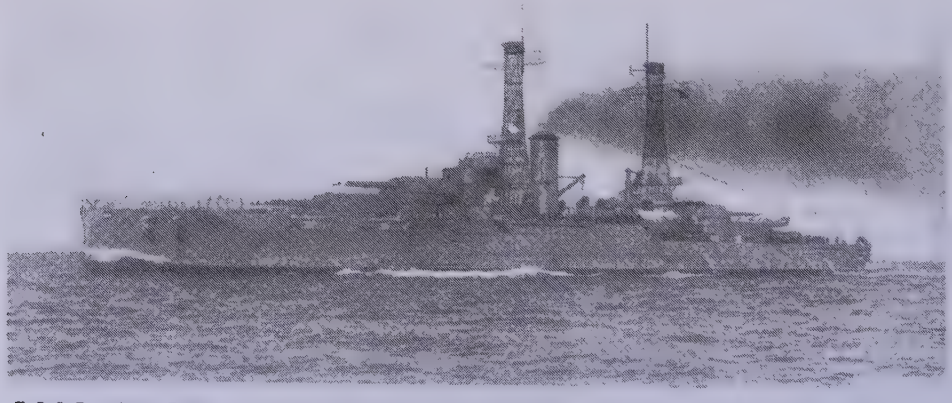
The owner's stateroom is aft of the engine and boiler space. The room itself has more than 300 square feet of floor space, and connecting with it on one side is a bathroom, 8 feet by 10 feet, fitted with shower, needle and other baths and on the opposite connecting is a wardrobe 6 feet by 8 feet which is lined with cedar. These two rooms are as large as staterooms on many vessels. The living room, 24 feet long by 20 feet wide, is next aft, and a lobby at the after end of the living room has a stairway which leads to the guests' quarters below. Aft of this lobby is a shelter hood with divans and a cosy corner. The quarterdeck is 42 feet long.

The quarters for the officers and crew are forward of the machinery space. Next aft of the collision bulkhead is a toilet for the crew and then the forecastle 25 feet long which is fitted with folding berths, transoms, lockers and a wardrobe for each man. The officers' quarters and messroom occupy a space of 26 feet fore-and-aft, extending the full width of the vessel. There are eleven officers' staterooms, each fitted with a wardrobe, bureau, mirror, transom seat and two berths. There are two galleys, one for the owner and the other for the crew. Each is fitted with a refrigerator, ice-box, cooking range, dressers, sink and dumbwaiter.

The yacht is lighted by electricity, the generator sets being operated by steam turbines, and in addition there is an Edison storage battery of double the capacity that is usually found on a yacht of the size of Nokomis. Instead of the conventional way of heating the yacht with lines of steam pipes and radiators, this is accomplished with a system of Thermo-fans, supplying heat in cold weather, cool air in hot weather and ventilating the yacht under circumstances when the atmospheric conditions are not favorable for natural ventilation. The water tanks are carried below the cabin floor, and running water is supplied to all the lavatories by means of air pressure supplied by electric pumps. The yacht's equipments also include an ice-making machine, refrigerating plant, which, together with the large fresh-water tanks, coal carrying capacity, etc., will enable the yacht to go offshore for a long period of time.

Nokomis is driven by a pair of three-cylinder triple-expansion engines driving twin-screws, so that in case of any accident to one set of the propelling machinery the other set will still be able to drive the vessel at full eight-tenths of the maximum speed, which is 16.25 nautical miles an hour. Steam is generated in Babcock & Wilcox water-tube boilers, the same as used in the United States and British Navies. They are set in a watertight compartment facing each other, each piped up completely with pumps, etc., cross-connected, so that one can be run entirely independent of the other. The yacht will have a fuel capacity of 350 tons of coal, carried in bunkers alongside the boilers and athwartship bunkers, and will insure exceptionally large cruising radius at different speeds.

The yacht will carry seven boats. The largest is a 35-foot express launch named Nokomis Junior, built by the C. C. Smith Boat & Engine Company, builders of Miss Minneapolis and Miss Detroit, and driven by two six-cylinder Van Blerck engines. This boat is 7 feet breadth, will carry eight or ten passengers, and make 40 miles an hour. The other boats, specially designed by Mr. Gielow and built by Wood & McClure, at City Island, N. Y., are a 30-foot service launch and two 21-foot power launches. There are also two metallic lifeboats and one power lifeboat.



U. S. S. Pennsylvania, Flagship of the Atlantic Squadron. The Largest Superdreadnought in the Navy. 600 Ft. on the Water-line, 97 Ft. Breadth, 28 Ft. 10 In. Mean Draught, 31,400 Tons Displacement. Speed, 21 Knots on Trial Trip. Four 21-In. Submerged Torpedo Tubes, Twelve 14-In. Guns, Twenty-two 5-In. and Four 3-Pounders

The Engines in the Automobiles Exhibited at New York's Shows

By A. E. Potter

FOLLOWING a year of unprecedented prosperity in the Automobile industry, the two New York automobile shows, held early in January, were eminently successful, both in the matter of attendance and in sales recorded. The Automobile Salon, the successor to the Importers' Salon, which was organized some thirteen or more years ago, following the refusal of the Association of Licensed Automobile Manufacturers to permit foreign-built cars to be exhibited in their exclusive show, was held as usual in the golden ballroom of the Hotel Astor. There were fifteen exhibitors of automobiles, thirteen of them each showing but a single type or model of engine, while two each had two models. Three types were of foreign design and construction, viz.: Isotta-Fraschini, and Lancia, both Italian, and Rolls-Royce, English. The F. I. A. T., while of American manufacture, is of Italian design.

The Nineteenth Annual New York Automobile Show was held in the Grand Central Palace, January 6th to 13th. At the Grand Central Palace Show, there were 90 concerns exhibiting gasolene-propelled pleasure vehicles, not including an exceedingly practical motorcycle, the product of the Militaire Motor Vehicle Company of America.

Of these 90 car exhibitors, 62 showed each but a single model of engine, 25 showed each two models, two had three each, and one exhibitor had five different engine models in his display, making a total of 123 different engine installations to be investigated here, in addition to the 17 at the Hotel Astor. Of the 140 there were seven V-twelve-cylinder, sixteen V-eight-cylinder, seventy six-cylinder and forty-seven four-cylinder different engine installations. One of the V-eight-cylinder engines was of the Knight sleeve valve type, the Willys-Knight, and of the four-cylinder engines, one was a Brewster, another a Willys-Knight, and the third a Moline-Knight.

It truly can be said that these two shows were of extreme interest to the boating and yachting enthusiasts, who annually attend to inspect new models of cars, and new features in the accessory line which will make for greater convenience and utility, or promise increased fuel economy. If one were to believe all that the dozen or more carbureter demonstrators each year say, it seems that one should be able to operate even large marine gas engines at such a fuel economy that a dollar for fuel for a complete season would even leave a balance for other necessities.

The power-boating devotee or enthusiast quite naturally should be more interested in the engines themselves than in other features possessed by the cars shown. I devoted my attention almost exclusively to the design and construction of and information and data concerning the engines in the various cars. This information has been rather difficult to obtain. Much of the necessary data offered by salesmen has been inaccurate and misleading, and a careful weeding-out process has left some features and observations which should be of interest to readers of THE RUDDER, especially to those who were unable to attend, or who failed to observe features here recorded.

I have arranged in alphabetical order the various cars exhibited, with the name of the engine or engines used, the number of cylinders (those marked "V—" indicating that they are of "V" or inclined type), their bore and stroke, the speed and rated horsepower, next the rating by the Society of Automotive Engineers formula, and the mean effective pressure necessary to develop the manufacturer's ratings at the speed specified. The name of the carbureter then follows, and finally the type of ignition.

The S. A. E. rating assumes a net mean effective pressure of 67½ lb per square inch, and is found by multiplying the square of the bore by the number of cylinders and dividing this product by 2½, a constant which gives approximately correct results.

The M. E. P. or mean effective pressure, is one of the four elements necessary to compute the horsepower of an internal-combustion engine. These four elements are as follows: Bore, stroke, number of explosions per minute and mean effective pressure. The first three are readily understood, while the last may need a little explanation.

One horsepower is defined as sufficient power to lift 33,000 lb one foot in one minute, or 33,000 foot-pounds. If one knows the net average pressure in pounds per square inch exerted against the piston during the power stroke, the area against which this pressure is exerted, the length of the stroke and the number of explosive impulses per minute, it is a simple mathematical problem to compute the horsepower, multiplying the M. E. P. by the square of the bore expressed in square inches, by the length of stroke in feet, by the number of explosions per minute, this product being foot-pounds, which, being divided by 33,000, will give the developed or claimed horsepower.

In order to arrive at the net M. E. P., which is the mean or average pressure less the frictional loss and the power used to pre-compress the charges of gas before they are ignited, the area of the cylinder bore is multiplied by the length of the stroke in inches, divided by 12 to reduce to feet and multiplied by the number of explosions per minute occurring in all cylinders, and this result is used as a divisor, the dividend being the total foot-pounds claimed by the manufacturer, this latter being found by multiplying the claimed horsepower by 33,000. The quotient is the net M. E. P. necessary.

While the S. A. E. formula assumes a net M. E. P. of 67½ lb per square inch, the American Power-Boat Association assumes but approximately 61 lb. In the former a piston speed of but 1,000 feet per minute is assumed, while the latter, except in special rating for hydroplanes, takes into consideration both the length of stroke and the number of revolutions per minute.

Of the 140 total different engine installations in the two shows, forty-five had magneto ignition and ninety-five used battery distributers.

A few manufacturers still hold to T-head construction with non-removable cylinder heads, among this number being F. I. A. T., Lancia, Locomobile and Simplex-Crane, at the Automobile Salon, and Pierce-Arrow, Lozier, Stutz and Winton at the Grand Central Palace Show. Practically all the four and six-cylinder engines with few exceptions other than above noted had their cylinders cast en bloc, or in a single casting, although two or three sixes had cylinders cast in threes. It was the exception to find any one of these engines not provided with removable cylinder heads.

Quite a large number had overhead valves, a few of them in retaining cages, but for the most part in the removable heads. In several of the engines having removable heads vertical valves were used. A very large majority of the four and six-cylinder engines, however, were of L-head construction.

In the V-type engines removable heads were in the majority, at least two manufacturers having changed their design to embody the feature of removable head, the advantages of which from a manufacturer's, as well as operator's viewpoint, are being at present more fully appreciated.

Two engines in particular proved interesting, the Marmon and Premier. These were of aluminum, cylinders, heads, crank cases and pistons. The valve seats and cylinder sleeves of grey cast-iron were inserted by chilling the iron parts and expanding the aluminum by the application of heat. Aluminum alloy pistons were more in evidence than a year ago, although some manufacturers who used them last year have gone back to cast-iron. Two manufacturers, Franklin and Pierce-Arrow, still retain their seven-bearing crank-shaft design, the only cars possessing this feature.

Several four-cylinder engines are using only two-bearing crank shafts, and one or two manufacturers of six-cylinder engines are using four-bearing crank shafts, all the balance using the more common three-bearing design. A notable increase in counterbalanced crank shafts was evidence that, with the higher piston speeds as a result of small bore and more cylinders, this feature is a desirable one. The adoption of patented piston rings and tungsten alloy exhaust and inlet valves by many manufacturers who did not employ them a year ago, is expressive of their advantages.

The change from magneto to battery ignition was marked. This change is due to three causes, economy, possibility of combining ignition with starting and lighting, which practically every car had, and also the added advantage of securing the same intensity of spark at low as at high speed, or at advanced or retarded timing. With hardly an exception every engine used either a gear or plunger pump for circulatory lubrication purposes. Practically every engine used the Stewart or some other vacuum feed system.

From the accompanying table it may be observed that 62 of the 140 installations were of stock engines not manufactured by the manufacturers of the cars, divided as follows: 24 Continental, 6 Herschell-Spillman, 4 Buda, 4 Rutenber, 3 Teetor, 3 Weidely, 3 Lycoming, 2 Le Roy, 2 Northway, 2 Falls, 2 Ferro, 2 G. B. & S., 1 Metz, 1 Beaver, 1 Colonial, 1 Sterling, 1 Wisconsin.

It will be noted that there is a great variation in the horsepower claimed for installations of the same engine. For instance there are thirteen Continentals, 3¼-inch bore and 4½-inch stroke. One manufacturer claims 40 h.p. at 1,500 r.p.m., and another 40 h.p. at 2,200 r.p.m.

In the matter of net M. E. P. necessary to develop claimed horsepower at given speed, there will be found an interesting diversity. For instance, at 1,500 r.p.m. we find 61.82, 78.40 and 94.30. At 1,600 the lowest is 75.79 and highest 93.80. At 1,800 the range is from 58.29 to 85.36. At 2,000 the lowest is 63.65 and highest 93.11. At 2,200 the range is from 56.25 to 78.04, with an average of 67.12. At 2,400 the highest is 79.56 and lowest 54.44, with an average of 67.05. When we get to 2,600, the range is 97.08 down to 44.23; at 2,800 from 78.34 to 59.32; at 3,000 from 66.23 to 56.17, and at 3,600 the high is 84.24 and low 72.03, while at 3,100, 3,200 and 3,300, the M. E. P. is respectively 64.55, 52.74 and 56.09.

In the above comparisons of M. E. P. at different engine speeds I have excluded the following, viz.: Locomobile, Winton and Emerson because the claimed horsepower was less than by S. A. E. formula, and Pierce-Arrow, as two of their three models are rated lower than by S. A. E.

The Biddle engine had individual flexible steel tubing connecting each cylinder with the exhaust piping. The Brewster had a new engine manufactured under Moline-Knight license. The F. I. A. T. was exhibited at both shows as were both Roamer types. The White four-cylinder engines had each two inlet and two exhaust valves. This feature was present in one of the Drexel models, the horsepower rating being more than 50% higher at 400 r.p.m. additional speed, it is claimed, as a result of the double valve design. The new Stutz also had double valves.

The Moline-Knight four-cylinder used a separate exhaust from each cylinder to a manifold. The Lexington used a Moore multiple exhaust, each alternate cylinder being connected to a header and claimed 22.8% greater power, although the Continental engine used was rated by the manufacturer of the car as 35 h.p. at 2,200, while another manufacturer at the same speed claims 40 h.p. for the same engine not so equipped.

The above are but a few of the interesting features, many of which were extremely hard to secure except by close and careful observation and diligent questioning of salesmen who apparently did not know of or seem to realize the importance of features which one schooled in marine gas enginery would readily appreciate and value highly.

While some of the features are new to automobile design, such as double valves, at least one, that of double valves, was several years ago anticipated by James Craig, and if my memory serves me right, one model of Truscott engine possessed this feature. Craig also anticipated cylinder sleeves, using this construction in the non-magnetic survey boat Carnegie. However, after having looked over and into every new feature of design and construction brought out in the past year and here shown, I am firmly of the belief that for economical operation, stability, long life and up-to-the-minute design, automobile engine designers "have nothing on" the designers of American-built marine gas engines, and that not a single one of the 140 installations would be suitable or give satisfactory operation if installed in a power boat, where, unlike the demand of the automobile where, as someone has estimated, the full power of the engine is utilized but one per cent of the time, the marine engine is operated at its full capacity 99% or more of the time it is run.

It is a good thing for the marine engine designer and manufacturer to watch automobile engine design and construction, and I have no doubt that the automobile engine designer could profit from a careful study and an analytical observation of the engines exhibited at the 1917 New York Power-Boat Show.

EXHIBITED AT THE AUTOMOBILE SALON, HOTEL ASTOR, NEW YORK, JAN. 2-10, 1917

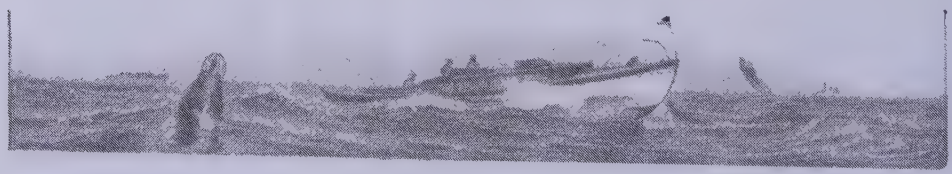
Car	Engine	Cyls.	Bore	Stroke	R.P.M.	H. P. Mfrs.	H.P. S.A.E.	M. E. P.	Carbureter	Ignition
Biddle	Buda	4	3¼	5⅛	2100	48.0	22.5	79.94	Zenith	Eiseman Mag.
Brewster	Brewster-Knight	4	4	5½	2000	65.0	25.6	93.11	Zenith	Bosch Mag.
Daniels	Hersch.-Spill	V-8	3¼	5	2400	80.0	33.8	79.56	Zenith	West'gh's. Distr.
F. I. A. T.	F. I. A. T.	4	5⅛	6¾	1650	85.0	42.02	73.25	Zenith	Bosch Mag.
Isotta-Fraschini	Isotta-Fraschini	6	4⅛	7⅛	1800	70.0	40.84	85.36	Zenith	Bosch Mag.
Lancia	Lancia	4	4⅜	5⅛	2700	72.0	44.63	70.54	Lancia	Bosch Mag.
Locomobile	Locomobile	6	4½	5	1800	38.0	43.35	39.34	Locomobile-Ball	Eiseman Mag.
	Locomobile	6	4½	5½	1800	48.0	48.6	40.24	Locomobile-Ball	Eiseman Mag.
Murray	Hersch.-Spill	V-8	3¼	5	2800	85.0	33.8	72.45	Zenith	Dixie Mag.
Novara	Novara	4	3	4¼	3200	35.0	14.4	61.28	Zenith	Bosch Mag.
Phianna	Phianna	4	3⅛	6	2200	55.0	24.02	69.96	H. & N.	Bosch Mag.
Roamer	Rutenber	6	3⅛	5	2200	45.0	23.44	70.45	Stromberg	Bosch Mag.
	Hersch.-Spill	6	4	3½	2400	90.0	38.4	71.62	Stromberg	Bosch Mag.
Rolls-Royce	Rolls-Royce	6	4½	4¾	1800	70.0	48.6	67.95	Rolls-Royce	Bosch Mag.
Simplex	Crane-Simplex	6	4⅛	6¾	2200	110.0	45.95	70.24	Simplex	Bosch Mag.
Singer	Hersch.-Spill	6	4	5½	1900	100.0	38.4	100.52	Rayfield	Bosch Mag.
White	White	4	4¼	5¾	2500	72.0	28.9	69.82	White	Bosch Mag.

EXHIBITED AT THE NEW YORK AUTOMOBILE SHOW, GRAND CENTRAL PALACE, JAN. 6-13, 1917

Car	Engine	Cyls.	Bore	Stroke	R.P.M.	H.P. Mfrs.	H.P. S.A.E.	M. E. P.	Carbureter	Ignition
Abbott	Continental	6	3¼	4½	2600	44.0	22.35	59.80	Stromberg	Remy Distr.
Allen	Allen	4	3¾	5	2400	37.0	22.49	55.25	Stromberg	West'gh's Distr.
American	American	6	3	5	2600	45.0	21.60	64.64	Zenith	Gray & D. Distr.
Apperson	Apperson	V-8	3¼	5	2200	65.0	33.80	70.26	Johnson	Remy Distr.
	Apperson	6	3½	5	2200	48.0	29.40	59.87	Rayfield	Remy Distr.
Auburn	Teetor	6	3⅛	5	2500	39.0	23.44	53.70	Rayfield	Remy Distr.
	Continental	6	3½	5¼	2600	44.0	29.40	44.23	Rayfield	Remy Distr.
Austin	Weidely	V-12	2⅞	5	3600	100.0	39.67	84.24	Stromberg	Delco Distr.
Bateman	Le Roy	4	3½	4½	2200	26.0	15.62	67.80	Schebler	Atwater Kent Distr.
Ben Hur	Buda	6	3½	5¼	2200	60.0	29.40	71.27	Gravity	Bosch Mag.
Bour-Davis	Continental	6	3¼	4½	1800	40.0	25.25	78.58	Stromberg	Remy Distr.
Briscoe	Briscoe	4	3⅜	5⅛	1600	31.0	16.26	93.80	Carter	Splitdorf Distr.
Buick	Buick	4	3⅜	4¼	2250	35.0	19.22	72.32	Marvel	Delco Distr.
	Buick	6	3¼	4½	2200	45.0	25.35	76.03	Marvel	Delco Distr.
	Buick	6	3⅜	4½	2500	60.0	27.34	80.94	Marvel	Delco Distr.
Cadillac	Cadillac	V-8	3⅛	5⅛	2800	80.0	31.25	67.16	Cadillac	Delco Distr.
Case	Case	4	3⅜	6	2000	40.0	21.02	63.95	Rayfield	Conn. Distr.
Chalmers	Chalmers	6	3¼	4½	2600	45.0	25.25	61.20	Stromberg	Remy Distr.
Chandler	Chandler	6	3⅜	5	2300	35.0	27.34	46.20	Rayfield	Bosch Mag.
Chevrolet	Chevrolet	4	3 11/16	4	2200	30.0	21.57	63.20	Zenith	Conn. Distr.
	Chevrolet	V-8	3¾	4	2200	49.0	36.45	62.64	Zenith	Conn. Distr.
Cole	Northway	V-8	3½	4¾	2800	73.0	39.20	59.62	Stromberg	Delco Distr.
Columbia	Continental	6	3¼	4½	2000	38.0	25.25	67.18	Stromberg	Atwater Kent Distr.
Crow-Elkhart	Lycoming	4	3½	5	1800	34.6	19.60	79.12	Zenith	Conn. Distr.
Cunningham	Cunningham	V-8	3¼	5	3000	94.0	45.00	56.17	Stromberg	West'gh's Distr.
Dodge	Dodge	4	3⅞	4½	2500	35.0	24.03	52.38	Stewart	Delco Distr.
Davis	Continental	6	3¼	4½	2600	44.0	25.25	59.84	Stromberg	Delco Distr.
	Continental	6	3½	5¼	2600	60.0	29.40	60.31	Stromberg	Delco Distr.
Detroiter	Continental	6	3¼	4½	2400	45.0	25.25	66.30	Ball & Ball	Conn. Distr.
Dort	Lycoming	4	3¼	5	1900	33.6	16.83	84.41	Carter	Conn. Distr.
Drexel	Drexel	4	3½	5	3200	41.0	19.60	52.74	Stromberg	Bosch Mag.
	Drexel	4	3½	5	3600	63.0	19.60	72.03	Stromberg	Bosch Mag.
Elcar	Lycoming	4	3½	5	1800	34.6	19.60	79.12	Carter	Delco Distr.
Elgin	Falls	6	3	4¼	2200	35.0	21.60	69.90	Stromberg	Remy Distr.
Emerson	Metz	4	3¾	4	2700	22.0	22.50	33.20	A. W. T.	Atwater Kent Distr.
Empire	Teetor	4	3⅛	5	2000	40.0	24.02	67.16	Stromberg	Conn. Distr.
	Continental	6	3¼	4½	2000	40.0	25.25	70.72	Stromberg	Conn. Distr.
Enger	Enger	4	3 11/16	4½	2400	36.0	21.57	67.03	Stromberg	Atwater Kent. Distr.
	Enger	V-12	2 11/16	3½	3000	56.0	34.79	62.06	Stromberg	Remy Distr.
F. I. A. T.	F. I. A. T.	4	5⅛	6¾	1650	85.0	42.02	73.25	Zenith	Bosch Mag.
Franklin	Franklin	6	3¼	4	1900	34.0	25.25	71.20	Franklin	Atwater Kent Distr.
Grant	Falls	6	3	4¼	2700	36.0	21.60	58.58	Stromberg	Remy Distr.
Hal	Weidely	V-12	2⅞	5	2000	70.0	39.67	71.19	Stromberg	Remy Distr.
Harroun	Harroun	4	3¼	5¼	2800	40.0	16.9	64.93	Bell	Bosch Mag.
Haynes	Haynes	6	3½	5	2400	55.0	29.4	62.88	Rayfield	Delco Distr.
	Haynes	V-12	2¾	4	2500	72.0	36.3	80.01	Rayfield	Remy Distr.
Hollier	Hollier	6	3	4¼	1800	26.8	21.6	65.42	Stewart	Conn. Distr.
Hudson	Hudson	6	3½	5	2450	76.0	29.40	85.12	Hudson	Delco Distr.
Hupmobile	Hupmobile	4	3¾	5¼	1850	47.0	22.50	82.78	Zenith	Atwater-Kent Distr.
Interstate	Beaver	4	3½	5	2700	38.0	19.60	57.93	Schebler	Remy Distr.
Jackson	Ferro	V-8	3	3½	3100	50.0	28.80	64.55	Zenith	Remy Distr.
Jeffery	Jeffery	4	3¾	5¼	2200	40.0	22.50	62.07	Rayfield	Delco Distr.
	Jeffery	6	3½	4¾	2400	53.0	29.40	65.13	Rayfield	Delco Distr.
Jordan	Continental	6	3½	5¼	2300	55.0	29.40	62.49	Stromberg	Bosch Mag.
Kent	Continental	4	3¾	5	2400	40.0	22.50	59.76	Zenith	Bosch Mag.

EXHIBITED AT THE NEW YORK AUTOMOBILE SHOW, GRAND CENTRAL PALACE, JAN. 6-13, 1917—*Continued*

Car	Engine	Cyls.	Bore	Stroke	R. P. M.	H. P. Mfrs.	H.P. S.A.E.	M. E. P.	Carbureter	Ignition
King	King	V-8	3	5	2400	60.0	28.80	70.03	Ball & Ball	Atwater Kent Distr.
Kissel	Kissel	6	4¼	5	1500	50.0	43.35	61.82	Stromberg	Remy Distr.
Kline	Continental	6	3¼	4½	2000	38.0	25.25	67.18	Rayfield	West'gh's. Distr.
Lexington	Continental	6	3¼	4½	2200	35.0	25.25	56.25	Rayfield	Conn. Distr.
Liberty	Continental	6	3¼	4½	2200	40.0	23.40	69.54	Rayfield	Delco Distr.
Lozier	Lozier	6	3⅞	6	1600	65.0	36.04	75.79	Rayfield	Eiseman Mag.
McFarlan	Teetor	6	4½	6	2000	90.0	48.60	62.25	Stromberg	Bosch Mag.
Majestic	Colonial	V-8	3	5	2500	60.0	28.80	67.23	Zenith	Atwater Kent Distr.
Marmon	Marmon	6	3¾	5⅛	2450	74.0	33.75	74.04	Stromberg	Bosch Combined
Maxwell	Maxwell	4	3⅝	4½	1700	33.8	21.02	84.76	K. & D.	Atwater Kent Distr.
Mercer	Mercer	4	3¾	6¾	2300	73.0	22.50	84.30	Corser	Bosch Mag.
Metz	Metz	4	3⅞	4	1800	25.0	24.02	58.29	A. W. T.	Dixie Mag.
Mitchell	Mitchell	6	3¼	5	2000	40.0	25.35	63.65	Rayfield	Splitdorf Distr.
	Mitchell	6	3½	5	2000	48.0	29.40	65.85	Rayfield	Splitdorf Distr.
Moline-Knight	Moline-Knight	4	4	6	1600	50.0	25.60	82.06	Schebler	Conn. Distr.
Monroe	Monroe	4	3⅛	4½	2600	44.0	15.60	97.08	Zenith	Conn. Distr.
Moon	Continental	6	3¼	4½	2000	43.0	25.35	76.02	Rayfield	Delco Distr.
	Continental	6	3½	5¼	2200	66.0	29.40	78.04	Rayfield	Delco Distr.
Marion-Handley	Rutenber	6	3⅛	5	2000	40.0	23.44	68.32	Stromberg	West'gh's. Distr.
	Continental	6	3½	5¼	1900	60.0	29.40	82.53	Stromberg	West'gh's. Distr.
National	Continental	6	3½	5¼	2200	51.0	29.40	60.58	Rayfield	Dixie Mag.
	National	V-12	2¾	4¾	2800	71.0	36.30	59.32	Rayfield	Delco Distr.
Oakland	Northway	6	2⅞	4¾	2500	41.0	19.84	70.20	Marvel	Delco Distr.
Oldsmobile	Olds	6	2 13/16	4¾	2600	41.0	18.94	58.78	Johnson	Delco Distr.
	Olds	V-8	2⅞	4¾	2900	56.0	26.45	45.10	Johnson	Delco Distr.
Overland	Overland	4	3⅜	5	2100	30.0	18.22	65.70	Tillotson	Conn. Distr.
	Overland	4	4⅛	4½	1800	35.0	27.22	64.02	Tillotson	Conn. Distr.
	Continental	6	3¼	4½	2100	35.4	25.35	59.61	Tillotson	Conn. Distr.
Owen-Magnetic	Buda	6	3¾	5½	2200	60.0	33.75	59.24	Zenith	Bosch Mag.
	Continental	6	3½	5¼	2400	50.0	29.40	54.44	Zenith	Bosch Mag.
Packard	Packard	V-12	3	5	2600	90.0	43.20	86.94	Packard	Delco Distr.
Paige	Rutenber	6	3⅛	5	1800	39.0	23.44	74.58	Rayfield	Remy Distr.
	Continental	6	3½	5¼	2000	51.0	29.40	66.60	Rayfield	Remy Distr.
Paterson	Continental	6	3¼	4½	2600	45.0	25.25	61.20	Stromberg	Delco Distr.
Pathfinder	Weidely	V-12	2⅜	5	1900	75.0	39.67	80.30	Stromberg	Delco Distr.
Peerless	Peerless	V-8	3¼	5½	3300	85.0	33.80	56.09	Ball & Ball	Atwater Kent Distr.
Pierce-Arrow	Pierce-Arrow	6	4	5½	1400	38.0	38.4	51.86	Pierce-Arrow	Bosch Mag.
	Pierce-Arrow	6	4½	5½	1400	48.6	48.6	51.74	Pierce-Arrow	Bosch Mag.
	Pierce-Arrow	6	5	7	1400	66.0	60.0	45.28	Pierce-Arrow	Bosch Mag.
Premier	Premier	6	3⅜	5½	3000	72.0	38.4	66.23	Johnson	Delco Distr.
Princess	G. B. & S.	4	3¾	4¼	2800	36.9	22.5	68.58	Schebler	Dixie Mag.
Pullman	G. B. & S.	4	3¾	4¼	2400	32.0	22.50	69.58	Stromberg	Dixie Mag.
Puritan	Buda	6	3¼	5⅛	1900	48.0	33.75	58.91	Webber	Eiseman Mag.
Regal	Regal	4	3½	4¾	2400	32.0	19.60	57.87	Carter	Heinze-Spgfr. Distr.
Reo	Reo	4	4⅛	4½	1400	40.0	27.22	94.07	Johnson	Remy Distr.
	Reo	6	3⅜	5⅛	1700	50.0	30.46	72.47	Rayfield	Remy Distr.
Roamer	Rutenber	6	3⅛	5	2200	45.0	23.44	70.45	Stromberg	Bosch Mag.
	Hersch.-Spill	6	4	5½	2400	90.0	38.40	71.62	Stromberg	Bosch Mag.
Saxon	Saxon	4	2¾	4	2600	20.0	12.10	64.11	Reitenbacher	Atwater Kent Distr.
	Saxon	6	2⅞	4½	2200	30.0	19.84	61.64	Rayf. or Stromb.	Remy Distr.
Scripps-Booth	Sterling	4	3 11/16	4	2100	30.0	21.57	66.21	Zenith	Remy Distr.
	Ferro	V-8	2⅝	3¾	3000	35.0	22.05	56.92	Zenith	Remy Distr.
Standard	Hersch.-Spill	V-8	3¼	5	2500	82.0	33.80	78.29	Zenith	Dixie Mag.
Stearns-Knight	Stearns-Knight	4	3¾	5⅝	2400	49.0	22.50	65.04	Rayfield	Remy Distr.
	Stearns-Knight	V-8	3¼	5	2400	70.0	33.80	69.61	Rayfield	West'gh's. Distr.
Sterling	Le Roy	4	3⅛	4½	2200	28.0	15.62	73.01	Stromberg	Bosch Mag.
Studebaker	Studebaker	4	3⅝	5	1800	40.0	21.03	85.27	Schebler	Wagner Distr.
	Studebaker	6	3⅝	5	1650	50.0	31.54	77.51	Schebler	Wagner Distr.
Stutz	Stutz	4	4⅜	6	2550	85.0	30.63	73.15	Stromberg	Bosch Mag.
	Wisconsin	4	4¾	5½	1600	65.0	35.70	82.53	Stromberg	Bosch Mag.
Sun	Sun	6	3⅛	5	2750	50.0	23.44	61.91	Rayfield	Remy Distr.
Westcott	Continental	6	3½	5¼	1800	51.0	29.40	74.44	Rayfield	Remy Distr.
Willys-Knight	Willys-Knight	4	4⅛	4¼	2100	48.0	27.22	75.25	Zenith	Remy Distr.
	Willys-Knight	V-8	3⅛	4	2800	78.0	36.45	78.34	Zenith	Remy Distr.
Winton	Winton	6	3¾	5½	1000	33.0	33.75	71.68	Rayfield	Bosch Mag.
	Winton	6	4½	5½	1000	48.0	48.60	72.43	Rayfield	Bosch Mag.
Velie	Continental	6	3¼	4½	1500	40.0	25.35	94.30	Stromberg	Remy Distr.
	Continental	6	3½	5¼	1500	45.0	29.40	78.40	Stromberg	Remy Distr.



Excerpts from the Summer Log of the Yacht Eloise

By George Burnside Story, M.D.

ON the evening of June 19, 1916, the yacht Eloise, of Portland, Ore., having on board Dr. Robert H. Ellis, owner and captain, and a party of friends, left her moorings at the Portland Motor Boat Club, bound for a cruise along the littoral of the State of Washington and Northwest British Columbia.

In addition to the Skipper the ship's company was made up of Prof. Norman F. Coleman, Prof. William C. Morgan, both of Reed College, Mr. Edward Boyce, Dr. Harvey G. Parker, and the writer. The crew consisted of three sailors, Gerard Graham, Thomas Boe, John Denman, Winn Nicholas, engineer, and "Doctor" Howard, chef.

The Eloise (formerly the Gulma) is a schooner-rigged yacht, with a 40-h.p. auxiliary Wolverine gas engine, which is capable of developing about 8 knots. She has most beautiful lines, an over-all length of 85 feet, 18½ feet breadth, 7 feet draught, which is supplemented by a centerboard. Built in Boston, Mass., by Lawley, she had proven her wonderful seaworthiness during her trip from Boston to Portland, Ore., (via the Panama Canal) in 1915, when she weathered the smashing gales of Cape Hatteras, the Gulf of Mexico, West Indies and the Pacific Ocean. Her appointments are so perfect, that not only solid comfort, but even luxury are assured. We had no fear of what her behavior would be on the North Pacific Ocean, and were reassured by the fact that the Skipper knew his boat perfectly, as he had handled her on both the Atlantic and Pacific under fair as well as foul weather conditions.



Yachts Eloise and Aquila in Princess Louise Inlet

After an uneventful run of more than 100 miles down the swift flood waters of the Columbia River we reached Astoria, where final preparations were quickly made, and being assured that the Columbia River bar was moderate, the order was given to weigh anchor and proceed to sea.

Standing out toward the Pacific we passed Point Adams, the Northwest point of Oregon, and were soon abreast of Cape Hancock on the Washington shore. Both Adams and Hancock were named by Captain Robert Gray in honor of the President of the United States and the Governor of Massachusetts respectively, when in 1792, in command of the ship Columbia, he discovered and entered the Columbia River. These two names are permanent records of the failure of the British to discover the mouth of the Columbia and the waters to the East, and upon Gray's discovery was based the claim of the United States for the possession of the Oregon Country, which was long afterwards recognized in right and subsequently followed by occupation, so by his discoveries Gray accomplished quite as much for the United States as Captain Vancouver did for Great Britain.

Cape Hancock, also called Cape Disappointment by Captain John Meares, together with Mackenzie and North Heads forms the precipitous headland which marks the Southwest point of the State of Washington.

While passing out over the bar, the Columbia River Lightship anchored off our port bow reminded me of the fact that the North Pacific Ocean is not always as calm as it was on this particular afternoon. During the Winter of 1889, while Post Surgeon at Fort Canby, I had witnessed the series of storms which had swept the Northwest Coast and which culminated in a hurricane during the night of November 29th, when Lightship No. 50, which had been torn from her moorings, was driven ashore at Mackenzie Head, and it was my privilege to have been with the Cape Disappointment Life-Saving Crew, when at midnight, during that awful storm, they rescued the Lightship's entire crew from certain destruction.

During the Summer months yachting on the Pacific is the acme of sport and no place can be found more delightful than the cruising grounds along the Washington and British Columbia coasts. Here the yachtsman finds all that can be desired, the sea open to every moderate breeze, bays and inlets extending inland to the very

foot of mountain ranges, sounds lying for hundreds of miles among countless islands, cities, towns, Indian villages and the high forest trees, which under the influence of the soft gentle skies of Summer, transform the whole landscape in such a manner that one who is a lover of the wilderness and the sports of the sea is charmed by the endless succession of beautiful and ravishing scenes.

The Washington Coast not only presents a wonderful scenic panorama, but is of especial historic interest, having been discovered in 1774 by the Spanish pilot, Juan Perez, who was in command of the first Northern Spanish Expedition.

Sailing North from Cape Hancock, a distance of about 20 miles, we passed "Willipa Light," which marks the entrance to Shoalwater Bay, a large basin of more than 100 square miles in extent. This bay was discovered and named by Captain John Meares in 1788. Vancouver failed to make any note of it on his charts or to mention it in his records, and it remained utterly neglected until surveyed by Lieutenant Alden, of the U. S. Coast Survey, in 1852.

Fifteen miles further North is Grays Harbor, which was discovered by Captain Gray in 1792. He named the harbor Bulfinch, in honor of Dr. Bulfinch, of Boston, one of the promoters of Gray's first expedition. Later in the same year, Captain Vancouver, who was then at Nootka Sound, sent one of his officers, Lieutenant Whitbey, to explore this harbor with the result that Vancouver named and charted it Grays Harbor, which name has prevailed.

Rising from the North of Grays Harbor is a group of mountains, of which Mt. Olympus is the most elevated peak; this range is isolated and forms the culminating ridge of the peninsula between Puget Sound and the sea. This peninsula is bounded on the West by the Pacific, on the North by Juan de Fuca Strait, and on the East by the long and numerous branches of Admiralty Inlet; on the Sound it is connected with the continent only by a narrow isthmus between the Southern end of Puget Sound and Grays Harbor and Shoalwater Bay. If Puget Sound and the lagoons of the Columbia River Delta were joined, the Mt. Olympus range would be a perfect island. Probably this was once the case.

Mt. Olympus, the summit of which is covered by perpetual snow, is a conspicuous peak, which can be seen from far out on the ocean and must have been to the navigator a prominent landmark, being the first point visible to the eye on approaching land. It was discovered by Perez, who called it El Cero de la Santa Rosalia (the peak of Santa Rosalia). This name was not introduced into geography, because the Spaniards made nothing known about their early Northwestern explorations. Captain Meares saw the mountain on the 4th of July, 1788, and gave it the name Mt. Olympus.

From Grays Harbor we made for Point Grenville (named by Captain Vancouver in April, 1792, after the Right Honorable Lord Grenville). This headland is so prominent that it undoubtedly attracted the attention of the early explorers, for Bruno Heceta, in command of the Santiago (1775), as well as Vancouver (1792), when they sighted it, sailed at once to it, leaving Shoalwater Bay and Grays Harbor to their right unnoticed and unexplored. Heceta and Perez landed here July 14, 1775, and formally took possession of the country between Alaska and California in the name of Spain. Among the many accidents which have taken place at this point in former times was the remarkable occurrence of the wreck of a Japanese junk, which happened in the year 1833.

For a distance of about 30 miles Northward of Point Grenville the coast presents nothing remarkable until Destruction Island is reached. This is the largest detached piece of land on the whole Western Coast between Point Conception and Cape Flattery. Lying about three miles offshore, it rises abruptly by rocky walls to a height of 90 feet, presenting a flat top and barren aspect. While this island may have been seen by Drake in 1578, there are no particulars concerning this part of his voyage. It was first recognized by the Spanish expedition while searching for the Strait of Juan de Fuca. Here they met with the loss of seven of their scurvy-stricken crew, who were sent on shore for water, were attacked and killed by the Indians.

The coast from Destruction Island Northward presents a broad open bay which affords no protection, the shores of the bay as well as the coast further North are lined with rocks, the most remarkable group of which are called Flattery Rocks, which form a series of irregularly shaped islets, more than twelve in number. From the South they have an appearance somewhat like Cape Flattery; here, as well as at the cape, the continent projects in a rounded headland and from both of these headlands chains of small rocks project outward toward the ocean.

In 1778 Cook saw these rocks from a distance and flattered with the hope that he would find a harbor in their vicinity, called them and the projecting headland Cape Flattery. However, he found no harbor nor did he find the entrance to de Fuca Strait.

In 1787 Berkely discovered the entrance to de Fuca Strait and the entrance cape to the South, where he found an Indian village called Classet, and an island called Tatooche. When Vancouver arrived here in 1792, he passed Flattery Rocks and sailed directly to the South entrance cape, where he looked out anxiously for the point which Captain Cook had distinguished by the name of Cape Flattery, and came to the conclusion that Cape Classet was identical with that called by Cook Cape Flattery. Later he recognized Flattery Rocks, and resumed the appellation of Cape Flattery for Cape Classet, and charted Cook's Cape Flattery as Flattery Rocks. It is a remarkable circumstance that Cape Flattery (the extreme point of the Western Coast of the United States) has been comparatively a late discovery, as most of the capes on the Oregon, California, Washington and Vancouver Island Coasts were known long before this cape was mentioned.

Cape Flattery is 500 or 600 feet high and falls off to the water by steep rocky bluffs; the extremity of the cape is furthermore broken up into a series of rocky islets, which extend for a distance of about three miles out into the Pacific.

Tatooche Island, which is about one-half mile in circumference, is the largest of the islands of Cape Flattery. It rises abruptly from the sea in steep barren cliffs at a distance of about two miles from the cape. The island is of an oblong shape and bears a verdant and fertile appearance without any trees. On the East is a cove which divides the island into two almost distinct portions. Vancouver, in describing this island, states: "The upper part of the cliff in the center of the cove, had the appearance of having been separated by art for

the protection or convenience of the village there situated, and has a communication from cliff to cliff above the houses of the village by a bridge or causeway over which the inhabitants were seen passing and repassing." Here are now located a lighthouse, fog signal and radio station.

Reaching a point to the Northwest of Cape Flattery, we changed our course to the East and entered the Strait of Juan de Fuca, the most remarkable inlet of the whole Pacific Coast of the continent of America, and as stated by Professor Maney, "one of the greatest geographical puzzles of the world." It is not at all improbable that the entrance to this broad strait was seen by the early navigators, as during the 17th and 18th centuries it was generally believed that a Greek pilot in the Spanish service, Juan de Fuca (or Apostatos Veleranios) had entered this strait in 1592 and on nearly all maps of that time a strait was laid down between 45° and 48° North latitude. It was at one time believed to be the same as the so-called Strait of Anian, which was supposed to connect Hudson Bay with the North Sea. Our course lay along the Southern shores of de Fuca Strait; proceeding a few miles Eastward, we passed Neah Bay. Of the many small harbors in this section Neah (to sail out) is the most interesting and has been longest known. This little bay is closed on the Northeast by a small island called Waaddah. Along the inner shore lies an elevated beach upon which the famous Indian village Classet, which gave its name to the locality, was situated. In 1792 Vancouver (Vol. I, page 218) mentions and describes this bay, but he did not find it worth his while to anchor there. However, that same Summer Don Salvador Fidalgo was sent to this port from Nootka Sound to establish a Spanish settlement and to erect fortifications. The Indian name for this harbor was Quinacarnot. It was afterwards charted as Fidalgo Cove, and it is supposed that the name Neah Harbor was first introduced by the Hudson Bay Company. Today there is quite a settlement here, fishing and canning industries, lighthouse and U. S. Coast Guard stations, fuel station and anchor harbor for the Puget Sound tugboats.

The Southern shores of the de Fuca Strait are hills in the immediate neighborhood of the water, of a moderate height, and many low, sandy cliffs fall perpendicularly on beaches of sand and stone. From the top of the cliffy eminences the land takes a further gentle and moderate ascent and is entirely covered with trees, until the forest reaches a range of high craggy mountains, which seem to rise from the woodland country in a very abrupt manner, with a few scattered trees on their silent sides and their summits covered with snow.

Sailing Eastward past Callam and Crescent Bays at a distance of 60 nautical miles from the entrance to the strait, we entered the harbor of Port Angeles on the afternoon of June 22d, and dropped anchor opposite the center of the town. This fresh-water harbor was formerly known as Dungeness (False), though it was discovered by Quimper in 1790, and called by him Puerto de los Angeles (the harbor of the angels). This name was retained by Vancouver and likewise the English Admiralty charts and is therefore the true name of the harbor. The harbor is covered to the North by a long low sand spit, which extends Easterly a distance of



Two Views of Princess Louisa Inlet



Passing Through Deception Passage

about three miles from the mainland. The extreme point of this spit is known as Ediz Hook, upon which is a lighthouse and fog siren station.

At 4 a. m. on the morning of June 23d, we were again underway, headed for New Dungeness Bay, which was also discovered in 1790 by Don Manuel Quimper and named after him Bahia de Quimper. He called the long projecting cape or sandy tongue, which extends to the East, Puerto de Santa Cruz (the port of the holy cross). This locality was only recognized by Vancouver in passing at a distance. It appeared to him to be something like the situation of Dungeness in the British Channel, and he therefore called the sand promontory New Dungeness.

From New Dungeness we headed for Wilsons Point, at the Northwest entrance to Admiralty Inlet. It was so named by Vancouver in honor of Captain George Wilson, of the British Navy. Opposite Wilsons Point on Whitbey Island is Admiralty Head. Passing through Admiralty Inlet, we entered Puget Sound, and after a delightful sail, anchored off the Seattle Yacht Club, where we received a most hospitable welcome.

Regarding Puget Sound, Vancouver says in his narrative: "To describe the beauties of this region will on some future occasion be a very grateful task for the pen of a skilled panegyrist. The serenity of the climate, the immeasurable pleasing landscapes and the abundant fertility that unassisted Nature puts forth, require only to be enriched by the industry of man, with villages, mansions, cottages and other buildings to render it the most lovely country that can be imagined. Whilst the labour of the inhabitants would be amply rewarded in the bounties which Nature seems ready to bestow upon cultivation."

Leaving Seattle on the afternoon of June 25th, we proceeded North on the East side of Whitbey Island. Vancouver's officer, Lieutenant Whitbey, explored the waters surrounding this island in 1792 and it has ever since retained his name. Late the same evening we anchored in a snug harbor, called Algers Bay, on the West side of Camino Island.

Whitbeys Island is the largest island of this whole region, extending a distance of about 30 miles from North to South, and is from two to five miles broad. It has a very irregular form, two broad ends and a narrow body. On the North it is separated from Fidalgo Island by Deception Passage. The island presents in many parts a most delightful prospect, spacious meadows, beautiful pastures adorned with clumps of oak trees, many modern farms and summer homes. One of the most delightful and attractive spots on the island is known as Penns Cove, a spacious bay to the Northeast of Port Gardner.

Deception Passage is a narrow and intricate channel, being about three miles in length from East to West and in parts only some hundred yards broad between Fidalgo and Whitbey Islands. Whitbey, who discovered it, thought it to be impassable for large vessels and probably from this circumstance Vancouver called it Deception Passage. We navigated through here on June 26th, and made for Lopez Island across the Strait of Rossario.

The name Lopez is probably of Spanish origin and probably it was derived from the discoverer of this archipelago, Lopez Gonzales de Haro. It will be noted that many of the islands and passages between them bear names of Spanish origin, having been discovered and explored prior to the expedition of Vancouver, and we marveled at the fact that over a hundred years ago the Spanish navigators with their crude vessels and equipment had visited these waters, which are so little known in the world today.

Sailing between Lopez and Orcas Islands we reached Friday Harbor, which is situated on the East Coast of San Juan Island. Friday Harbor is a most attractive and active settlement of about 300 inhabitants. Here is located the station of the Biological Department of the University of Washington; the Summer school was in session with an attendance of about 75 students matriculated from various sections of the United States. After a pleasant and instructive visit to the station we were off again to the North, reaching Dodds Narrows about noon the following day, through which we passed without mishap and were soon safely anchored in the beautiful harbor of Nanaimo, our port of entry into British territory. While in the States we had heard many reports

of the stringent activities of the Canadian Customs officials exhibited toward visitors from the United States, and were very agreeably surprised at the most courteous reception we received. In addition to our "pratique," they gave us much useful information regarding the country which we were to visit, and a sincere invitation to make ourselves at home.

At dawn, June 29th, the anchor was weighed, and we were off for our destination, Princess Louisa Inlet. Under full sail, we sped at a 15-knot clip across the Straits of Georgia (the great interior basin between the mainland and Vancouver Island), and crossing Melaspina Strait, we entered Jervis Inlet by the way of Agememnon Channel, where we left the line of steamship travel. Owing to the narrowness of the waters from here on we were obliged to furl sail and travel under engine power.

Here the scenery is beyond description. The wilderness is practically uninhabited, except for an occasional small logging camp or an Indian village. Passing through Prince of Wales Reach and Prince Royal Reach, the scenery increases in grandeur. The perpetual snow-covered mountains rising abruptly from the sea level to an altitude of over 6,000 feet in the neighborhood of Deserted Bay, where all of the beauties of Switzerland, Norway and Alaska are combined. From Deserted Bay we traveled about seven miles up Queens Reach, which brought us opposite the entrance of Louisa Inlet, which is only a few hundred feet wide and less than an eighth of a mile long. The entrance to the inlet is bordered on each side by glacial furrowed embankments, most beautifully and symmetrically patterned by "Nature's jackplane." The waters rush back and forth through here at such a rate that it is impossible to negotiate this pass without great danger, excepting under favorable tide conditions. Satisfying himself, after a careful survey of the entrance from the shore, the Skipper returned to the yacht, and taking the wheel piloted her safely through into the inlet where all danger was passed. The basin in which we so quickly found ourselves is three or four miles in length and one or two miles in breadth. Here the rugged mountains rise by vertical escarpments to a height of over 8,000 feet, the spray from countless waterfalls shrouding portions of the walls of this wonderland. Near the center of the body of water is a wooded island, the shores of which afford excellent anchorage, though the main body of water is very deep. The almost perpendicular mountain sides abound in game, and we enjoyed seeing "big game" and mountain goats, so high above the water level that at times even with the aid of powerful glasses they appeared to be mere dots among the rugged cliffs.

The following day was spent in small boats, exploring the most wonderful shores of the inlet, and after successfully trolling for king salmon, we passed out of the inlet and reached Deserted Bay late in the evening, the twilight lasting far toward midnight.

Leaving Deserted Bay on the morning of July 1st (Dominion Day), we traveled Southward, reaching Buccaneer Bay, on Thornaby Island, a most beautiful Summer resort, at 5:30 in the afternoon. On the following morning we sailed through Welcome Pass, and all day long enjoyed a mild gale which forged us past all vessels, sail and steam, but the Princess Patricia, the Canadian crack ship, and brought us into Vancouver Harbor in the early evening. Sailing South, we passed the mouth of the Frazier River, entered and sailed through Active Pass, a narrow and swift bit of water between Galiano and Mayne Islands, reached Roche Harbor, on the Northwest point of San Juan Island about eight o'clock in the evening.

The forenoon of July 4th was spent visiting the Roche Harbor lime plant, and at 1 p. m. sails were set for Victoria. After a splendid sail across Haro Strait, we anchored off the Victoria Royal Yacht Club (at Cadboro Bay). Going ashore, we were soon in Victoria by electric car, where we spent the afternoon and evening of July 4th.

Leaving Victoria July 5th, we experienced head winds and were obliged to tack between the North and South shores of de Fuca Strait. Sailing South, we crossed into the Columbia River at 4 a. m., July 7th, and were soon at anchor off Astoria.

The return trip from Astoria was made under sail, against a strong current, in 14 hours' sailing time. We dropped anchor at the Eloise's home berth, Saturday evening, July 8th, nineteen days out, with a well and happy crew, all thoroughly convinced that the American traveler, at least, should see the North Pacific Coast first.

Breakwaters in the Bay of Biscay

By Capt. Geo. S. Laing

WATER in general and the sea in particular is a recognized servant of man and a good and faithful one, too. But like other servants of humanity, the sea has its furies and abnormal tendencies. Under these conditions it needs the cleverest of structural engineering to tame it and beat it back.

Thus the prime function of a breakwater is to combat the onslaught of the waves, making thereby a safe and comparatively smooth anchorage within its boundaries.

It is no ordinary contractor who builds a breakwater, or for that matter, any structure that has to fight and hold at bay the sea. The work of erecting the greatest breakwaters and exposed lighthouses is executed by men who take a very personal interest in every block of stone or concrete that makes the mammoth things grow.

A great many initial problems are wrapped up in the planning of these marine arms of succor. Such things as nature of sea bottom, depth of water, grade of sea floor, etc., make up a few of the nuts to be cracked by the building engineer.

In some cases soft sea floors have to be solidified with rubble stone, while a jagged, rocky bottom may have to be leveled by filling the holes with huge bags of cement. These bags are put into their respective places by the guidance of divers in conjunction with heavy floating cranes. Then the concrete blocks may be expected to sit in true position. These blocks are made in huge moulds—mud-pie fashion—and taken to the building site on scows, or handled from the shore end by a special crane called the Titan.

Where breakwaters have to withstand an ocean severity, a toe or base of loose blocks of concrete or rubble stone is dumped on the weather side. This prevents the poundage of the waves from actually hitting the real breakwater, and is also a necessity to keep the undertow with its fearful suction from undermining the foundations. Further, a slope on the weather side causes the heavy waves to leave their natural roll and throw themselves into the air.

Height above normal sea level is not much in evidence, as that would really be a weakness, so a certain amount of spent water covers all breakwaters in heavy gales. It is a magnificent spectacle to see the wild whitecaps madly rushing along the concrete structure, while the raging gale blows the spume and briny froth in among the anchored vessels on the inside.

In the majority of cases breakwaters are enormously expensive and are a real necessity from a commercial standpoint. Some open harbors demand a protection from the sea, otherwise their sea-borne trade would vanish. Again, some coasts are so positively dangerous to shipping that from a humane point a harbor of refuge, in the shape of a breakwater, has to be erected.

All have heard of the Bay of Biscay, and some have heard the old song, "There she lay till next day," etc. This part of the North Atlantic Ocean washes the West coast of France and the North coast of Spain. Here is a part of the world that appreciates good breakwaters. The whole sweep of the Atlantic comes rolling in under the pressure of the Westerly winds. Right in the Southeast corner of this world-famed Bay of Biscay, the French and Spanish borders meet, and there also does the mighty ocean spend its final thrust on the rocky coast. Woe to any craft, steam or sail, that gets out of command in this locality.

San Juan de Luz is more of a harbor of refuge for steam trawlers or coastwise vessels that may be caught in the teeth of a gale when near the land, and thus helpless for want of sea-room to fight the elements. Riding out heavy gales under the lee of this old sea-wall has quite a nautical fascination attached to it. The enclosed area being small, the vessels must be pretty close together, and while the crest poundage is taken out of the waves, the swell still enters the gaps, causing the shipping to roll and dive considerably. This picture in itself is pretty as you stand on deck and view the other craft lowering their bows or burying their sterns in the surf. Should your anchors drag or the cables break, you are not worried with a long wait, as you may only be a hundred feet off the beach.

While sheltering under this French breakwater the steam trawler crews are fond of feeding the sea birds, which have also been literally blown inshore for the time being. It is quite interesting to watch the birds circle round and round and then swoop down close to the ship's side and snatch up a piece of fish entrail or other titbit that floats there.

No one but a seaman can really appreciate the comfort of these breakwaters. If a comparison between a ship on the outside and one within the walls could be drawn it would mean something like the difference between a man who is hopelessly groping with his last strength in a snow blizzard near his home, and one who is in ecstasy at his favorite pastime.

The San Juan de Luz shelter is much used by Bayonne traders. This famous port is a few miles upstream, and one of the most dangerous bars in the world marks the river entrance. In Winter it is a frequent occurrence for steamers to wait a week or more before the sea on this bar is negotiable, neither can vessels pass out to sea from the interior. With the wind from the Bay of Biscay, the bar of the Bayonne River is a turmoil of foaming billows. And yet, within sight of the Bayonne bar, we have one of Europe's most favored Winter resorts, Biarritz. This spot is ideal in temperature and climate generally, while hiding behind the woods and rugged coastline that says *stop* to the Atlantic in all its winter fury. King Edward was especially fond of this French town of fashion and leisure and the richest people in the world still make for it when opportunity leads the way.

The Spanish breakwater is named after the ore-famed town of Bilbao, although its strong concrete arm really protects the village of Portugalette at the entrance to Bilbao River. Before this breakwater was built, loading vessels with iron ore at Portugalette was a most dangerous problem. The vessel rolled to the surge of the open sea and the outside berth in this port was called "the Cape Horn dock," the inference being, of course, that a ship would lie as quiet off the historic cape as she would at Portugalette docks.

This concrete sea-wall is only fifty-odd miles West from the Bayonne bar, and is an untold blessing to the small steamers in the iron-ore trade. No rougher trade exists than the Bay of Biscay coasting traffic. Inured to the hardest of seafaring conditions, Bay of Biscay traders only take the protection of these sheltering breakwaters when it would be sheer madness to remain at sea.

The writer was a Bilbao trader before the Portugalette breakwater was made, and also witnessed its progress in building. Huge concrete blocks of 30 and 40 tons were largely used in the construction. During the few Winters, however, that saw the wall unfinished, a few of these loose 40-tonners were thrown around like dominoes when the gales came in with their allies, the waves, to pay their respects. Dover, England, has one of the most modern of breakwaters, and without it the British Navy would be at a great loss in this gigantic war.

Where seaboards or coasts have natural breakwaters, that is, islands with safe inside anchorages, then these artificial sea-walls have no existence. Nevertheless, they are a welcome factor in the Bay of Biscay, and crop up at different places throughout the world's coast-line.

The force that sea breakwaters must stand is more or less of an uncertain quantity, but several keen investigators state that from 2,000 to 6,000 lb per square foot is the range of pressure in gales. Even this enlightenment does not satisfy the ordinary reader, but when we have authentic record that waves can play ball with concrete blocks weighing 50 tons, rip wooden ships into kindling, and roll large iron steamers up into the adjoining fields, then we have a slight idea of what a sea breakwater or an Eddystone lighthouse has to fight against.

Some of the big waves that finish up on the Portugalette and San Juan de Luz breakwaters begin far out in the Atlantic Ocean, and the undertow and cross currents of the Bay of Biscay are the result of high-wave pressure on the iron-bound coasts of Western France and Northern Spain. The latest achievements in the breakwater line take in the Toro Point breakwater at Panama Canal entrance, while on our lakes, Cleveland has a breakwater that is hard to beat for strength and usefulness, and Buffalo has another.

Building the Bon Ami

By C. G. Davis

A NEWSPAPER proofreader, shy the major portion of a more or less useful left arm, is not usually associated with the boating game, let alone the construction end of it, so here is how the 35-foot launch Bon Ami was built—literally single-handed—by J. Stafford, of Detroit, Mich., who tells his experiences as follows:

Having some years before built a 25-foot V-bottomed sailboat that was very successful, I thought that type worthy of a trial as a launch, and sketched out a plan for a raised deck type of boat 30 feet long by 6½ feet breadth with 12 inches of deadrise.

Where to build was the next question. I lived a long ways from the river and no barn large enough for a 30-footer was available in our neighborhood, so the next alternative was to rent ground and put up a cheap shed near the river.

This shanty was 36 feet long, 10 feet wide, 6½ feet high at eaves and 9½ feet high at peak. On the North end was a lean-to 5 feet square, in which was the heating stove and back door. Round the corner was a second lean-to 5 feet by 8 feet, containing, later, a bunk, ice-box and gasolene stove. The whole edifice, when covered with tarred paper, was warm as toast in Winter and hot as the hinges in Summer.

Before the shop was finished I was gradually getting lumber for the boat—it wasn't easy even then to get good clear stuff—and it was stowed up under the roof to season.

The white pine for planking came last of all and when the teamster unloaded it, those clear boards, 18 feet long and over, looked too pretty to cut off to fit 30 feet, so I enlarged my plans to 35 feet by 8 feet breadth, with 18 inches of deadrise and a sort of steamboat cabin. The cabin was a later consideration, decided after the hull was finished, and turned over.

It was easier to build the hull bottom up, and I had made a rough midship section and demonstrated that the turn-over could be made without disturbing the house.

A draughting board upon which to draw the full-size plan of my boat was made by nailing a few clean pine boards intended for planking, seats, etc., to the floor joist which, when I built the shed, I had carefully spaced and set square every 4 feet.

With a chalk line, I snapped a base line 36 feet long and every 4 feet, the distance my moulds were to be apart, drew a perpendicular line equal to half the breadth of the boat.



The shed where Bon Ami was built

At one end I then measured off the half width of the transom, 2 feet 3 inches. To this point tacked one end of a long straight pole that reached about half the length of the boat. A nail 4 feet out from the center line represented the half-breadth of my boat amidships. I pushed the pole out against this nail and drove others behind it so it formed a fair curve that "looked good," and marked along this pole with a heavy lead pencil the half width of my boat at deck from the transom to amidships.

The pole was then pushed along to mark in the forward half of the boat. It was pulled in forward at the stem and when the curve "looked good" was marked in.

My idea was a boat sharp forward like a skiff, but full enough aft for good bearings. Her sides were to be straight as a wall, except a slight flare aft. In drawing out the sheer plan I used the same methods. Figured on a 27-inch side, this would be mostly freeboard, and with 18 inches deadrise would make her 45 inches deep amidships.

The chime was straight until about 10 feet from the stern, then curved easily upwards 8 inches.

The eight sets of moulds were easy to make; the deck plan gave their widths and the sheer plan their heights. They were made of ⅞ by 8-inch stuff and looked a little like a fence gate; the lower rail set on the floor joist, and the uprights projected below and were nailed to the side of the joist. Of course they were all set in line fore-and-aft ways.

The stern and transom frame were worked out from the plan and the sides just cleated together sufficient to hold, while springing them around the moulds. The sheer strake and chime strake were ⅞ by 8-inch oak, the rest white pine.

There were thirty sets of frames to fashion and fasten to the sides; these were ⅞ inch by 3 inches, set edgewise—this giving rigidity and a narrow surface to bevel. I let them project up 3 or 4 inches above the chime to catch the angle of the floor timbers when they were put in place. (The boat being built bottom upwards.) To show how unorthodox the boat was the deadwood was the last portion to be installed after the planking was all on.

A keel plank of ⅞ by 6-inch pine was then shaped out, and to hold it in place uprights of 6 by ⅞-inch stuff varying in heights to correspond with the sheer plan of the keel, were tacked to the center of each mould and over these the keel was laid, bent easily down at the ends, where it was fastened to the stem and transom.

Now for the floor timbers: to get their length I had only to measure from the side to the keel; the bevel was then easily measured.

A couple of ½-inch carriage bolts fastened these floor timbers to the side frames, and where the ends of the floor timbers came together on the keel a ⅞ by 3-inch strip was bolted to them and then this strip was bolted to the keel. With a sharp plane, and a bit of wood to test with, the edge of the side planks was then beveled so the plank would fit flat on them when laid at the angle made by these floor timbers.

Then came the planking up of the bottom, a joyous job, for those 18-foot by 12-inch boards seemed to fill up space fast and a shore or two up against a rafter spring them down.

The garboard, a 10-inch wide oak plank, next to the keel, was the only one needing spiling; then came a straight course of 12-inch pine, next an 8-inch oak strake to catch engine timber ends, and the rest pine.

Between the timbers at the chime oak blocks were fitted to give a wider nailing surface. This was well coated with red lead and the soft pine bottom planks were drawn against the oak so hard the lead squeezed out, thus needing no calking, and it "hasn't leaked yet." Used eightpenny galvanized wire nails and soaked all bolts in red lead and oil. A dozen of the frames amidships were further stiffened by a sort of knee, or corner piece, at the chime bolted to the frames and timbers.

Am sure my old grandad would have had a fit could he have seen the way the deadwood was finally put on. I could get no heavy oak, nothing but ⅞-inch stuff, so built it up of boards set on edge, well red-leaded and fastened to the keel by staples made of rod iron that went around under the deadwood were let in flush on each side and set up with nuts inside the keel and floor timbers.

In the meanwhile I had ordered my engine, a heavy, single-cylinder, 6-inch bore, 6-inch stroke, with a reversible propeller. The shaft supplied was so short I had to pitch the engine to quite an angle and it gave more draught than contemplated—over 4 feet.

Boring the shaft hole was a long, hard job. With a gouge, a red-hot bar and small augers, I got a hole through big enough for a boring bar I had rigged up. This trued up and enlarged the hole so a 1½-inch gas pipe could be driven through.

Through a square hole in the keel a sternpost, long enough to extend up a few inches through the deck and act as a towing post, was fitted at after side of the deadwood, but to get it in place a hole had to be cut through the roof of the shed. A skeg, 12 feet long, of 3-inch Norway pine, was bolted to the bottom of the deadwood to carry the rudder.

After two coats of paint had been applied and all the seams filled and smoothed, the boat was ready to turn over. Everyone but Bill Snodgrass said the shed would have to come down, that she wouldn't "flop" within a foot at least. But I got a couple of 4 by 4's, nailed a stout cross piece on the ends to hang a tackle on, stood them up on end against the middle of the high side of the house, cut a hole in the roof to let the tackle down through, hooked onto the midship frame and while Bill hauled away, I kept her pried as close to the wall as possible. She came up easily and was soon resting squarely on her port side with inches to spare. It was an easy matter to lower away, but before she could rest on an even keel, I had to dig a hole a couple of feet deep for the skeg to drop into.

My cabin, as stated, was an afterthought—another "by guess and by gosh" bit of work.

About this time they were breaking up an old steam yacht, the Sonora, and the wreckers told me to take anything I wished and welcome if I'd remove it myself. Here I got a lot of clear matched pine, doors, windows, skylight, white ash carlins, some black walnut and oak, that nearly sufficed for my needs and in a way determined the layout of the house.

There was an 8-foot after deck, a 6-foot forward deck and the rest was house. To get a fair headroom and not have too topheavy a look, I carried the pilothouse up square—the cabin was the full width of the boat—until I had a good 6 feet headroom.

The pilothouse was 6 feet long. For the rest I carried the sides up about 2 feet above the deck line, then "broke" the corners at about 45°; the center part of the cabin roof was about the same height as the pilothouse.

I used a single wide pine board ⅞ inch thick for this corner, which stiffened the whole cabin amazingly.

The cabin frame and carlins were ⅞ inch by 2 inches, the sides staved up vertically with ⅞-inch ceiling stuff. The windows I made out of odds and ends worked down to ⅞ by 1½ inch, and there was a lot of Sonora stuff in here.

The decks and roof were covered with 10-ounce duck, laid in thick paint and it was some job, as the shed roof was so close to the boat there was hardly room enough to swing a hammer.

The most useful member of my outfit of tools was the faithful hatchet. George Washington had nothing on me. I used it for everything a chisel, draw-shave, or adz could do, from sharpening a lead pencil to cutting a rabbet.

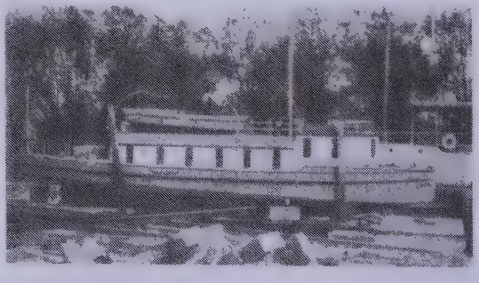
I had some trouble the first season with the engine. It took me all Summer to learn its "points," but that Fall it seemed to get down to work and we did quite a bit of running on the river, but made no long trips. She made 6½ or 7 miles an hour, and ran very easily and smoothly through the water, though the engine did shake her up fearfully.

The following Winter I stiffened her up with a 4-inch false keel and a 4 by 4-inch fender rail. While doing this I lengthened her nearly 4 feet aft—just continued the stern out, which gave a little cleaner run, more deck room and improved her looks.

With this added stiffening the engine did not shake her so much and could be opened wide, giving her a speed of 7 or 7½ miles.

In 1911 I got a Gray two-cylinder Model R, 12-h.p. engine and hooked it to the old shaft and wheel in place of the old single-cylinder engine, and this was a relief indeed. There was but little vibration and she speeded up to 8½ miles easily. The following season the propeller that belonged with this engine was put on; at 800 revolutions she showed 10 miles an hour speed.

Even in these days of high prices, anyone having a little spare time and ability to saw a board off square can, at a cost of $300 to $400, build a safe, comfortable, easy-running with low power cruiser on the lines of Bon Ami and get a lot of enjoyment out of it.



Bon Ami After She Was Lengthened

Leo Spitzer, Last of the Pirates

By Ogden W. White

YACHTSMEN who glide into The Thimbles, past High Island, to drop anchor in front of THE RUDDER Station on Money Island during the coming Summer will miss a familiar hail and will find one of their best friends absent, for "Leo" Spitzer, proprietor of the Island View Hotel, known to more yachtsmen than any man between Marblehead and Execution, familiar friend to cruising parties for over twenty years, chef extraordinaire, storekeeper, handyman and purveyor of everything from information concerning tide currents to the price of fresh eggs, is dead. Not to have known "Leo" was to argue oneself unknown in cruising circles in any club from Larchmont to Newport, and the figure of the swarthy, uncouth proprietor of the Island View, with his slow drawl, his saturnine smile, his yachting cap of the vintage of '75, and his dungarees faded to a dull drab brown from exposure to the elements and engine grease, used to be one of the most welcome landmarks of the skipper of the leading boat of the cruising fleet.

"The Last of the Pirates," as he used to call himself jokingly, looked back over a career of more than two decades. He had seen his little home on Money Island grow from a small cottage to a good-sized hotel; he had seen a casual and infrequent demand for his services grow to such size that it took all his time, and he had made such a host of friends among yachtsmen by his peculiar faculty of never forgetting a name or failing to identify it with a face, that skippers of small boats will be lost without the familiar greeting from the stone pier as they furl their sails or get ready to swing the dinghy from the davits preparatory to going ashore for one of "Leo's feeds."

Whether one reached the roadstead off Leo's place at five in the afternoon or at five in the morning, the method of procedure was the same. From the dock would come the slow, drawling:

"On bo-ard the Dol-phin! Can I do any-thing for you? Come a-shore when you get rea-dy. Want any New Yo-ork pa-pers? ice? bread? eggs? I'll be right out."

Most of the yachts put in at The Thimbles for over Sunday, and the New York clubs made the islands their first rendezvous on their cruises to the Eastward, reaching The Thimbles in time to get ashore for dinner. That dinner was liable to be eaten al fresco, out under the trees, served from the little kitchen in the lower floor, and welcome as manna to yachtsmen who were already tiring of the limited bill of fare on shipboard.

The following morning just as they were finishing their beauty sleep, the man under the hatch would be shocked into wakefulness by Leo barging into the side of his craft, and would raise a tousled head to see the saturnine grin of the proprietor of the Island View over the rail. Then came the following:

"I got all the Sun-day pa-pers—*World, Sun, Times*"—

"Well, give us a *Sun*"—

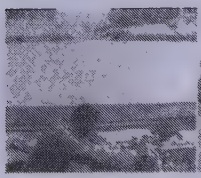
"Now, I only got one, and Mr. Phelps, over to High Island, he wants that, and I got to save it for him. Yes, I got two *Tribunes* and a *World*, but I'm savin' 'em for fellers on the other islands. Give you a *Her-rold*."

"Well, I don't want a *Her-rold*."

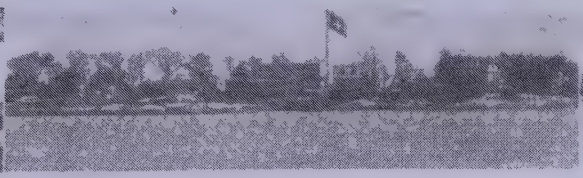
Eventually, if you got anything besides a "*Her-rold*" you were lucky. Leo was the best booster for that paper along the shore. If you wouldn't take one, you went without your Sunday reading, that was all.

The yachtsman who wanted to use the telephone might have been a German spy, if one were to judge by Leo's suspicions, for he hovered near the door of the telephone booth, fearful that some one would slip over a New York call on him and leave payment for one to New Haven. Twenty years of visiting yachtsmen had taught him to expect at least one Tartar in a season, and he took no chances, with the result that he was fair game for everyone who knew his eccentricities. Had he not been eccentric he would not have enjoyed the friendship and confidence of the yachtsmen, however. He would do anything for his friends; row ashore to Stony Creek, carry messages to other islands, supply halyard, cable or marlin, ferry off the ice, load stores, or even lend his clothesline to dry out dungarees moist with days of wet weather. Also he would indulge in persiflage, airy, even if slow, and in his own peculiar way enjoyed his little jokes as well as anyone. What he didn't know about the history of yachtsmen wasn't worth knowing, and one of the delights of a visit to The Thimbles was to get Leo to recount some of the adventures of former years.

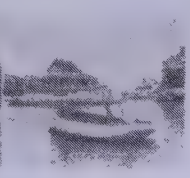
To strangers, he used to pretend he was the lineal descendant of Captain Kidd, and allude mysteriously to hidden treasure on one of the islands. He would retail circumstantial details of charts and plans to strangers, wag his head knowingly to the strangers, and with a wink to those of the party who were in the secret of the fabrication, and finishing, would betake himself around the corner of the pavilion casting back a sardonic grin as he went. "They say there is pieces-of-eight over to Pot Island," he would begin. "I been over lookin' for 'em,



Leo at Work on His Engine



Island View Hotel, on Money Island. The Rudder Station



Launch Leo

but I haven't found 'em yet." The stranger, hearing the yarn for the first time, would immediately be seized with a desire to go looking for bear prices on Pot Island, while those who had been fooled themselves years before would adjourn under the hill for their laugh.

Leo's appearance lent color to his pirate yarn, and the fact that he lived on "Money Island" helped their verisimilitude, too, although everyone knows that Money Island has been turned over three or four times by the spades of those seeking for "buried treasure." Leo found his buried treasure right in his hotel.

Every yachtsman will have his own store of anecdotes concerning the man. His impersonal attitude toward the hotel of which he was the proprietor was one characteristic. He would take out a party of Summer visitors from Stony Creek, pilot them through the islands till the pangs of hunger became acute, and then remark casually:

"They tell me you can get a good dinner up to the Island View."

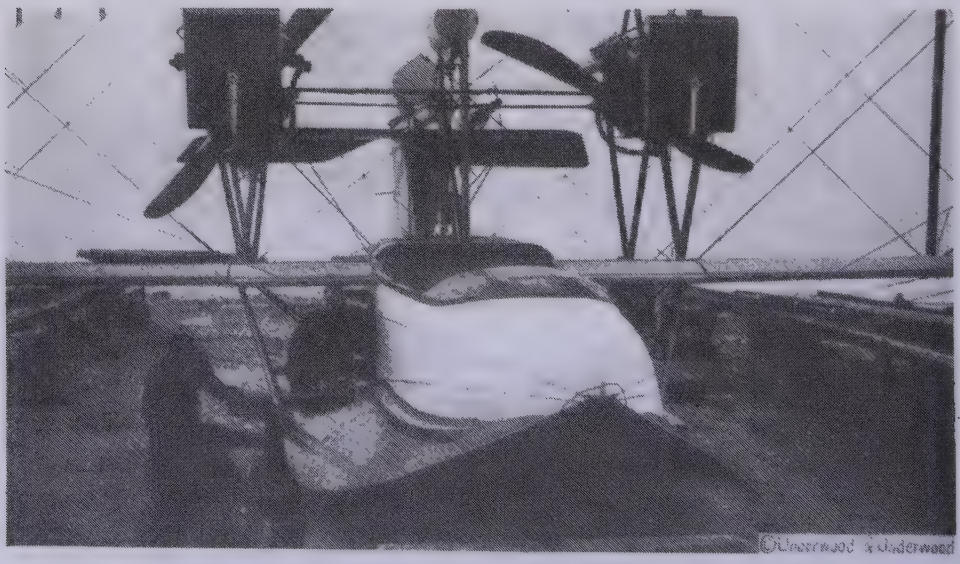
Well, you could, and there wasn't any obligation on Leo's part to say that it was his hotel, either.

Yale graduates of the past twenty years knew him well, too, and many were the pranks they played when cruising down for an over-Sunday sail from New Haven. How four of them painted his roof against his will, how he went ashore at full speed to get the constable, how the constable was enticed up on the roof and set to painting, while Leo tore his long hair on the greensward below, is a classic. It seems, the legend goes, that paint wasn't the only thing in the pails that day.

The Island View was the official Rudder Station in The Thimbles, and official supply house for visiting yachtsmen. It was Leo who held the mail "to be called for." It was Leo who was the authority on the depth of water between any two islands. It was Leo who could withstand more joshing and fun with a ready come-back than anyone else in the island. Yachtsmen knew and liked the saturnine, blackbearded man, and knew that although his bargains were waged with a perfect knowledge of conditions that prevailed "at sea," the fulfillment was more than agreed on.

Leo came to The Thimbles from New York twenty years ago. He was at that time secretary of the American Harness Association, but soon gave up his interest in the affairs of the harness racers for that in the constant flow of yachts and yachtsmen which passed him during the Summer. With the spread of the knowledge of his "feeds," it became necessary for him to enlarge his cottage into the present hotel, and some years ago he bought a farm on which he raised all the truck used there during the Summer. He went ashore to live during the Winters, but was on hand to catch the early birds cruising up the Sound in early May and remained on the job until late October.

The business will be continued by Mrs. Spitzer, who was the manufacturer of all the "home cooking" which brought yachtsmen to the hotel table, but "Leo," the inimitable, he of the ancient yachting cap, the unshorn cheek, the kindly drawl, will no longer be on hand to greet by name the members of a crew he hasn't seen for two years. The "Last of the Pirates," with his jokes, his stories, his reminiscences, and his long list of yachting friends, has gone.



The Giant Aeroplane Built for Rodman Wanamaker, by the Curtis Company for the American Trans-Oceanic Company, of Which Rodman Wanamaker Is President, Was Wrecked During a Gale Last Month. The Storm Blew Down the Hangar at Port Washington, Tore the Huge Ship From Her Moorings, Lifted It in the Air and Dashed It to the Ground, Smashing Everything, Including Thousands of Dollars' Worth of Scientific Instruments. This Picture Shows the Powerful Engines and Other Unique Features of the Hydro-Aeroplane

With Paddle and Sail in the Mermaid

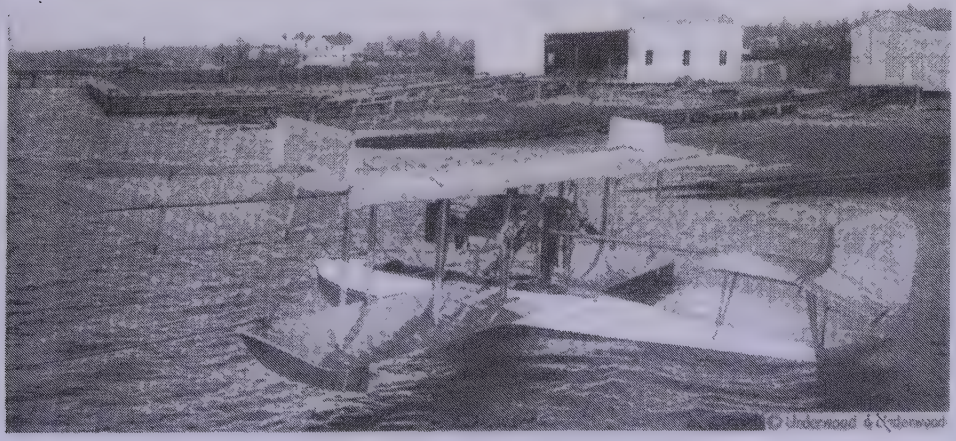
By Louis Weickum

IN these days of physical and mental activity, with numerous advocates of the "outdoor life" appealing directly to the busy intellectual workers imprisoned during the week in crowded office buildings, what is more alluring physically and mentally than a day's sport on the water in a small boat, either rowing, paddling, sailing or even power-boating? The waters in the vicinity of New York, particularly Long Island Sound, are ideally adapted for any kind of the foregoing methods of enjoying the exhilaration that comes with the moving, swaying waters, be it while holding the tiller and tugging sheet of a small sailing craft, which is the paramount sport to all lovers of an outdoor life on the water, either on a small lake or "deep water around the Horn," or the muscle-developing, lung-strengthening exercise of rowing or paddling, while running a power boat—unless it be a very speedy craft requiring careful steering—is looked upon by the "true blue" sailor as "sojering" being simply a convenience and not a sport, unfit for anyone who has heard the "call of the sea"!

The average young man of moderate means can either own a small row or sailboat independently or become a partner with one, two or three like spirits in joint ownership of a 25-foot cabin catboat or sloop, on which they can go sailing every week-end, or cruise about during vacation time, such a craft easily accommodating from four to six persons on seats, which in the evening are converted into bunks. A sailboat of this size can be bought for from $75 to $250 and up, is inexpensive to keep in commission, allowing that the crew are handy with tools, and when the assets are figured up at the end of the season, a good balance will be struck; counting expenditures, allowing a certain amount that would inevitably have been spent ashore at the many resorts for indifferent purposes without adequate return, except a commonsense view of the futility of obtaining any moral or physical enjoyment that way, amply compensated for by the healthy physical state, the steady nerves and cool judgment acquired through constant watching and handling of tiller and sails; the appetite whetted by a plunge overboard before dinner, and, above all, the wholesome, pure delight in Nature. Can a more profitable recreation be imagined?

The writer having made a couple of cruises to foreign lands aboard a full-rigged ship, and afterwards become one of the atoms in the human composition of a great city, after long and fatiguing periods of physical unrest, decided with a similarly minded friend to co-operate and build a small boat. A canoe was finally decided upon for various reasons: its handiness, inexpensiveness of both building and keeping, the healthy exercise of paddling, and possibly sailing, for it was not our intention at first to build a sailing canoe, and, more important than all these to enthusiastic minds, the added spice of adventure in sailing and handling a small boat requiring quick decision to accomplish good sailing.

We forthwith set to work, and in a week the plans had been drawn for a 15-foot, oak-built, canvas-covered canoe. And for almost eight months thereafter, during the Fall, Winter and Spring, working at our leisure during spare hours in the evening after a day's work in the office, gradually our jumble of wood assumed the graceful



This Aeroplane Was Built to Carry Eleven Persons. It Measures 76 Ft. From Tip to Tip, and Over All Was 54 Ft. Long. The Plane Was Equipped With Electric Lights, Electric Starter, a Searchlight, Automatic Pilot, and a Wireless Outfit. By Means of a Substantial Top the Cockpit Could Be Converted Into a Comfortable Cabin, With Windows for Use of the Passengers in Bad Weather

lines of a canoe. We worked away, and though there were times when we were almost completely discouraged and seriously considered having a grand bonfire of our uncompleted canoe, owing to the many almost insurmountable difficulties attached to building a canoe of hard wood, without previous experience and with only the facilities and tools found in the average suburban home, the eventful day finally arrived when "she" was carried on our shoulders at the head of a procession of relatives and friends, cynics, pessimists and scoffers, including a camera and the dog, to a small pond to launch her for a preliminary trial! And our labors and troubles were not in vain, and the critics were silenced.

There still remained the finishing touches, a bright green coat of paint, well varnished and polished. In the meantime, she was named Mermaid, and the decorating took shape in the figure of a mermaid rising above the water-line at either bow, and holding in her outstretched arms a golden ball. The scales of her tail were applied with gold-leaf on the one and silver on the other, that glistened and reflected on the water in the sunlight. The name was painted on each quarter. Needless to state, the decorations proved an attractive feature later, for the design and its execution were both unique and striking.

The paddles were bought, and a leg-o'-mutton sail spreading 27 square feet was rigged, but simply as an auxiliary, and made so that it could easily and quickly be dropped when necessary, for the Mermaid had no centerboard nor covered deck, and the sail could be used only when conditions were favorable.

So the Mermaid finally dipped into the waters of the Sound, and what good times we did have with her all Summer! We sailed and paddled her across the widest stretches of the Sound within the limits of the city, carrying her across necks of land when the waters at the point seemed too turbulent, withal proving quite handy and seaworthy, and paddled her up the narrowest creeks where the water was less than a foot in depth.

But in time the desire and need for improvements began to appear; primarily, the sail was too small; she would hardly make steerageway in a light breeze, and altogether too much leeway in a moderate or heavy breeze; with a larger sail we must necessarily have a covered deck, for the "lee rail awash" was impossible in an open boat, also either a deep keel or a centerboard, the first impossible and the second requiring valuable space inside, so leeboards were finally decided upon to keep her on her course when sailing close to the wind. Added a detachable folding brass rudder and air chambers placed on each side, and in the bow, to make her safer. The new sail when rigged was a "beauty." It spread 60 square feet to the breeze, with three short spars and two battens to flatten it, and could be set or dropped at a moment's notice, and could easily be reefed to half the exposed sail area when it blew too hard. The sail and leeboards were designed and placed with due regard to their proper position in relation to the center of effort and the center of longitudinal resistance, and the experimental trial was awaited with bated enthusiasm. Mermaid could be converted from a full-rigged sailing canoe to a paddling canoe, or vice-versa, in a few minutes, and spars, sails, rudder, leeboards, etc., could be stowed very conveniently in the bottom of the craft. These alterations were made after a Summer's use, when the boat was stored under cover for the Winter, and the following Spring the altered, improved Mermaid again floated upon the waters. And how well our expectations were realized! She seemed almost perfectly balanced, sailed quite as close to the wind as a catboat, and almost as fast, came about "like a top," and made but little leeway; the air-chambers were a success, and she was still roomy enough for two full-grown persons under sail and three under paddles.

We even made short cruises, camping out two or three days on one of the many beautiful spots to be found along both shores of the Sound. Our camping gear, ample enough for two, consisting of a small shelter tent, ponchos, blankets, and light cooking utensils, a camera and rifle, was easily carried aboard, and after a few hours' sail we would land, draw the Mermaid up on the beach, pitch the tent, start a small fire, and soon we would be enjoying our simple meal. A pipeful, a song, and a swim, and we would turn in, completely satisfied and at ease, until with the rising sun, we were up and getting breakfast. After lolling around for some time, our gear was stowed aboard again, and away we sailed for another spot, or, if pressed for time, sailed home, complacent, clear-headed and thoroughly equipped, mentally and physically, for the week's work in the office.

We gained a vast amount of practical experience in designing, and handling tools, etc., and developed physically while building and sailing the Mermaid. We had pleasant times taking out our friends, male and female, the latter well supplied with cushions and pillows, and at the moment of launching the second season, with all improvements, the total cost amounted to but $44. Could a pleasanter occupation and pastime during the Winter and Summer months be desired?



Uncle Silas, 38 Ft. x 10 Ft. x 3 Ft. Designed by J. Murray Watts. Power, Model F, 6-Cyl. Sterling, Turning a 25-In. by 27-In. Propeller 840 R.P.M. Speed, 18 Miles per Hour

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART II

IN an article like this detailed explanations of geometrical figures (shapes), rules of arithmetic, and mathematical formulæ would be out of place and wearisome; so I will assume that the reader has a sufficient knowledge of these things to enable him to understand the simple problems explained in this series of articles.

Those who desire to improve their knowledge of arithmetic, mathematics, geometry and elementary physics can obtain from THE RUDDER book department some excellent practical books on the subjects.

Instead of explaining all calculations, rules, and formulæ used by naval architects at one time and in the dry and uninteresting manner in which such things are explained in text books, I will explain a few important rules now and leave the others until it is necessary to use them; and as I will illustrate my explanations by actually measuring portions of boats the explanations will be interesting and the possibility of confusion eliminated.

RULES FOR MEASURING SURFACES

On Fig. 1 is an outline of a rectangular hatch opening. When an architect has to ascertain the area of such an opening he does it by measuring length and breadth and multiplying measures.

Thus, the Fig. 1 hatch opening being 2 feet wide and 3 feet long, its area is 6 square feet.

1. $2 \times 3 = 6$, and as both measurements are expressed in feet, the 6 stands for 6 square feet.

Any rectangular or square surface, or opening, can be measured by using this rule.

It is important to remember that all measures must be expressed in like terms. To explain this I will suppose that measurements of hatch opening are expressed thus—width, 24 inches; length, 3 feet.

The area cannot be ascertained by multiplying 24 by 3 because one measure is expressed in inches and the other in feet. Therefore, before making calculation one measure must be converted. The 3 feet can be converted into inches, then by multiplying 24×36, the area will be ascertained in *square inches*, or the 24 inches can be converted into feet and calculation made in the manner I made it. Or suppose the hatch opening measured 2 feet 6 inches and 3 feet 6 inches. Here both feet and inches are used, therefore the inches must be converted into decimal or fractional *parts of a foot* before the calculation is made. Thus 2 feet 6 inches must be expressed as 2.5 feet, or as 2½ feet; and 3 feet 6 inches as 3.5 feet, or as 3½ feet.

2. $2.5 \times 3.5 = 8.75$ square feet.
$2\frac{1}{2} \times 3\frac{1}{2} = 8\frac{3}{4}$ square feet.

Fig. 2 is an outline of a triangular-shaped sail. To measure the area of a triangular sail, or of any triangular surface, the following rule is used:

Multiply length of base by height and divide result by 2.

Set down as a formula the expression is

$$\frac{\text{Base} \times \text{Altitude}}{2} = \text{area of triangle.}$$

Any side can be termed the base, but altitude measure must be taken at right angles to base from base to highest point, or apex, of the triangle. As the sail shown measures 15 feet along base and 6 feet from base to apex, its area is 45 square feet.

3. $\frac{15 \times 6}{2} = 45$ square feet area.

Fig. 3 shows a circular opening in a deck, measuring 2 feet across.

The area of circular openings, or surfaces, can be ascertained by using this rule:

Square the diameter and multiply by 0.7854.

As the opening shown has a diameter of 2 feet, its area is 3.1416 square feet. You, of course, know that a circle is a plane figure all points of whose bounding line is an equal distance from a fixed point called the center.

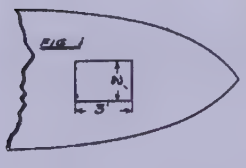
The bounding line is called the *circumference*.

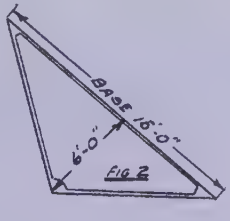
A straight line drawn through center and having its ends on circumference line is called a *diameter*.

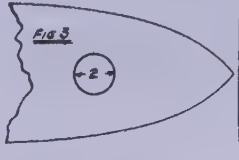
A straight line drawn from center point to circumference is termed a *radius*. The radius of a circle is always one-half diameter.

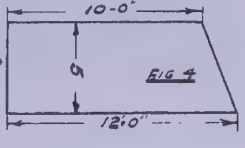
The circumference of a circle is always equal to diameter multiplied by 3.1416.

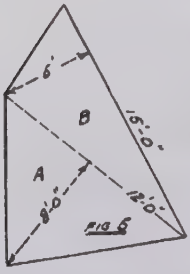
The diameter is always equal to circumference multiplied by 0.3188. Knowing these things it is an easy matter to quickly and accurately calculate the diameter, radius, circumference, and area of any circle.











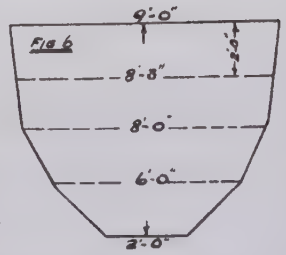


Fig. 4 shows a four-sided piece of metal and you will notice that only two of its sides are parallel. Such a shape is called a *Trapezoid* and its area is quickly ascertained by using this rule:

Multiply one-half the sum of parallel sides by the distance between them.

The parallel sides measure 12 and 10 feet and distance between is 5 feet; therefore the area is 55 square feet.

4. $11 \times 5 = 55$ square feet area.

Any surface of this shape can be measured by using this rule.

While the foregoing rules can only be used for measuring areas of shapes named, their use does not have to be restricted to measuring whole areas. Parts of areas can be measured, or any irregular area that can be divided into rectangles, triangles and circles can be measured by dividing the figure, measuring each part by the proper rule and adding totals.

As an easily understood illustration of this I call your attention to Fig. 4. That figure can also be accurately measured by dividing it into a rectangle and a triangle, measuring area of each and adding totals. Try measuring Fig. 4 in this manner and you will find that result is exactly the same as that obtained by using the trapezoid rule. Another easily understood example is the Fig. 5.

Here is another sail of a shape (called a trapezium) met with on a very great number of yachts. The shape is one that cannot be accurately measured at one time by any of the rules explained. The trapezoid rule will not do because none of the sides of figure are parallel; but if the figure is divided into two triangles, or into a rectangle and a triangle, or into a trapezoid and a triangle, and the area of the parts measured and measures added the area of the whole can be very quickly ascertained. On the illustration I have divided the area into two triangles. Using the figures marked the area of triangle *A* is 48 square feet, and that of *B* 37.5 square feet. Adding these the whole area is found to be 85.5 square feet.

You will find it excellent practice to mark out shapes like this one (drawing them to scale) and measure area by these three methods:

1st. By dividing figure into two triangles.
2d. By dividing figure into rectangle and triangle.
3d. By dividing figure into trapezoid and triangle.

If the measurements and calculations are accurately made totals will be alike.

So we have passed from regularly-shaped to irregularly-shaped figures. The dividing line is hardly noticeable, but it is there all the same, and so long as the bounding lines of a figure are straight ones, or segments of true circles, the area can be accurately determined by dividing the figure into parts, measuring each part by the proper rule and adding totals. This method is, however, rather cumbersome and for this reason is seldom used. So I will explain a better way to measure the area of any figure bounded by two straight parallel lines and two irregular straight or very slightly curved lines. This rule is called the *Trapezoidal*.

Fig. 6 shows an outline of a bulkhead of a boat. To measure such areas proceed as follows:

Divide the figure into any convenient number of parts by drawing parallel lines equal distances apart, measure length of each of these lines and then to one-half the sum of length of the first and last parallel lines add the sum of lengths of *all* intermediate lines and multiply by the distance the parallel lines are apart.

The lines should be drawn parallel with the straight bounding lines and must equally divide the distance between these lines. The area of Fig. 6 is 55.50 square feet. Calculate it for yourself.

While I am explaining this rule I will call your attention to a point of importance. Look at Fig. 6 and you will see that if a line is drawn from arrowpoint at top to arrowpoint at bottom, it will divide the figure into two exactly similar halves.

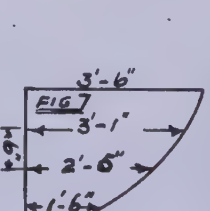
This is a boat's bulkhead and you know that the opposite sides of a boat are similar in shape or, expressed differently, if a boat were cut in two through its center from stem to stern (longitudinally) the two halves would be shaped alike. Therefore, it is a waste of time to show the shape of both sides of a boat on a drawing, or to calculate the areas of more than one-half of any bulkhead, water-line or cross section; because if the figures obtained by making a calculation in which one-half the width measures are used are multiplied by 2 the area of the whole (both halves) will be accurately determined with much less labor than if the whole area figures were used.

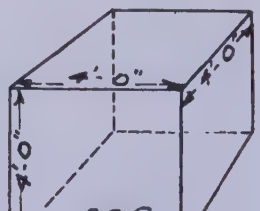
To prove this draw a line from arrow to arrow of Fig. 6; measure from this line out to bounding line on one side and make the calculation in manner explained. You will find that the area of half the figure is 27.75 square feet, and if this is multiplied by 2 the area of whole figure will be ascertained exactly.

The trapezoidal rule can be used to measure the area of any figure having bounding lines that are straight, or nearly straight. If the bounding lines of a figure have a large amount of curve the area must be measured by using one of the rules called *"Simpson's Rules."*

Fig. 7 shows half of a cross section and Fig. 8 half of a water plane of a boat. Areas like this can be accurately measured by using Simpson's rules.

The first of these rules I will now explain. Pay par-





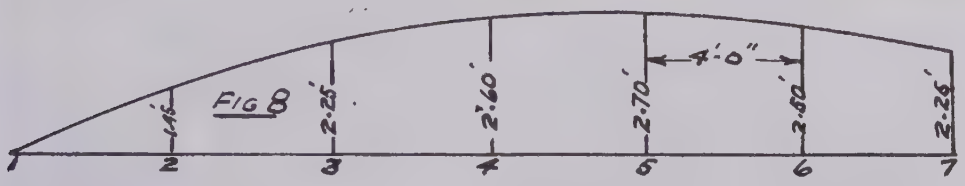


FIG 8

ticular attention to the explanation because this rule, and modifications of it, is used for making a great many of the displacement and stability calculations.

Explanation of Simpson's First Rule

Call the long straight line of figure the base line and divide it into any convenient *even* number of parts (*there must be an even number*). Erect perpendiculars (called ordinates) at each division point and number them from 1 up. These ordinate lines (perpendiculars) *must* be drawn at right angles to base line.

Measure the length of each ordinate line, then add together the first and last ordinate lengths, and four times the length of all even numbered ordinates and twice the length of all odd numbered ordinates except the first and last ones; the sum thus obtained multiplied by one-third the interval measure between ordinates will be the area of figure.

Of course as there is an even number of intervals there must be an *odd* number of ordinates. The calculation can be simplified and figures placed in convenient form for use when making other necessary calculations by tabulating them in the manner set forth below.

The Figs. 7 and 8 are divided in a proper and convenient number of parts for making the calculation.

Below I have tabulated the measurements of Fig. 8 and made the calculations in detail. For the tabulation, four columns are used.

In the first column is entered the identifying numbers of ordinates.

In the second column is entered the measured lengths of ordinates.

In the third column is entered the Simpson multipliers 1, 4, 2, etc.

In the fourth column is placed the product of column No. 2 measures and multipliers, called function totals.

The column No. 4 figures are totaled and result multiplied by one-third the measured interval between ordinates. The area of Fig. 8 as tabulated is 51.120 square feet. Study the tabulation and then measure the Fig. 7. Its area is 4.448 square feet.

Calculating Area of Fig. 8 by Simpson's First Rule

Ordinate No.	Ordinate Length in feet	Simpson's Multipliers	Function Totals
1	0.00	1	0.00
2	1.45	4	5.80
3	2.25	2	4.50
4	2.60	4	10.40
5	2.70	2	5.40
6	2.50	4	10.00
7	2.25	1	2.25
			38.35
Interval is 4 feet. One-third of this is			1.333
Area of Fig. 8 is			51.120 square feet

Again I want to call your attention to an important detail. For this calculation the interval measure is 4 feet. One-third of this is 1.3333+ the last figure being a repeating, or recurring, decimal. This being the case, it is evident that the figures obtained by making the calculation in the manner shown are *less* than the true total. So in cases when interval measure is such that an exact one-third cannot be used as a direct multiplier it will be more accurate and quicker to use the indirect method, which is: To multiply the total of column No. 4 by the *full interval* and then divide result by 3.

Making the calculation for Fig. 8 in this manner the result is:

Total of Column No. 4 is	38.35
Multiply by full interval	4
Divide by 3	3) 153.40
Area in square feet	51.133

The Fig. 8 is half of a water plane of a boat, if the calculation is for the purpose of ascertaining *area* of the *whole* water plane, then the figures 51.133 must be multiplied by 2. Thus the area of the whole water plane (the half shown on illustration and the opposite half that is not shown) is 102.266 square feet. I make this explanation for the purpose of insuring that you clearly understand the point.

I will now explain rules for measuring a few of the principal regular and irregular-shaped volumes. As volume is a measure of capacity, or bulk, three dimensions (length, breadth, and depth) must be known before a volume calculation can be made.

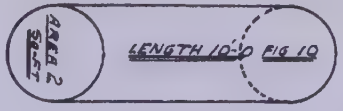
Rules for Measuring Volumes

Fig. 9 shows a rectangular block. The bulk, or volume of a block like this can be accurately measured by multiplying length, breadth and depth measures.

Length × breadth × depth = volume.

As all of the measures of Fig. 9 are in feet the volume, or bulk, is 64 cubic feet. If the measures were given in inches the volume would be expressed in cubic inches. This rule can be used for measuring volume of any rectangular-shaped object.

Fig. 10 shows a portion of a round column. The







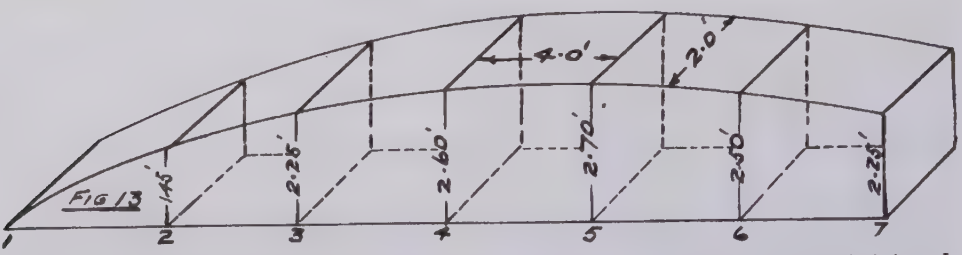


FIG 13

volume of any body having a cross section of similar area from end to end, regardless of shape of section, can be measured by multiplying area of cross section by length of body. Thus as the Fig. 10 cross section area is 2 square feet and its length is 10 feet, the bulk must be 20 cubic feet.

Fig. 11 shows a sphere, or ball. A sphere is a solid bounded by a curved surface every part of which is the same distance from the center point. To calculate the volume of a sphere use this rule:

Cube the diameter and multiply by 0.5236.

Fig. 12 shows a cone. A cone is a solid bounded by a curved surface tapering to a point, and having a circle as its base.

The volume of a cone is calculated by using this rule: Multiply area of base by the altitude of cone and divide result by 3. Expressed as a formula:

$$\frac{\text{Area of base} \times \text{altitude}}{3} = \text{volume of cone.}$$

The volume of a pyramid can be ascertained by using the same rule.

Fig. 13 shows an outline of a boat-shaped body having cross sections rectangular in shape. The volume of bodies like this is calculated by using Simpson's rules. The *area* of the longitudinal plane is first ascertained by dividing it into a proper number of parts, measuring the ordinate lengths and making a Simpson's first rule calculation in the manner I have already explained. If this area, expressed in square feet, is multiplied by the depth of body, expressed in feet, the volume of body will be ascertained.

For this illustration I used the Fig. 8 water plane and as the depth of body is 2 feet, the volume must be 102.266 cubic feet.

Fig. 14 shows an irregularly-shaped body like the underwater portion of one-half of a boat. To ascertain the volume of a body like this, Simpson's first rule can be used.

The body must first be divided *vertically* and *horizontally* into a proper number of equally spaced planes and sections for a Simpson's first rule calculation. It is not necessary that the interval distance and number of ordinates used be the same for both planes and sections.

The area of the several planes is then ascertained by making calculations in the manner explained (see calculation Fig. 8).

The area figures obtained by making these calculations are then used as ordinate measures for another Simpson's rule calculation. The result of this second calculation will give the cubical contents, or volume, of the body.

You will note that *two* separate and complete calculations are made. The first being a series of calculations to determine the areas of the several planes, and the second being a single calculation to determine the volume.

For the sake of avoiding the possibility of confusing you I use in my explanation the expression "Areas of the several planes." The calculation can be just as accurately made by calculating the areas of the several *sections* and using the section areas as ordinate measures for the second calculation.

Below I have made the complete calculation to determine volume of Fig. 14 by first calculating areas of the planes A, B, C, D, E, and then using these plane areas as ordinate measures for the volume part of calculation.

Go over the figures carefully and then prove that you understand the calculation by determining the volume of Fig. 14 by first calculating the areas of the sections and then using the section areas as ordinate measures for the volume part of calculation. If you make the calculation correctly the final (volume) figures will be within a few decimal points of my volume figures.

Bear in mind that for my illustration calculations the interval measure used for the plane area calculations is 4 feet (the distance sections are apart) and the interval measure for the second, or volume, calculation is the distance planes are apart (0.5 feet). For your calculation the interval measure for section areas is the distance planes are apart (0.5 feet) and for the volume part of calculation the interval is the distance sections are apart (4 feet).

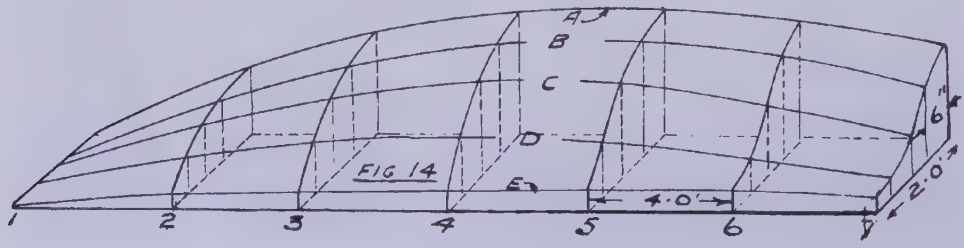


FIG 14

CALCULATION TO DETERMINE VOLUME OF FIG. 14

The Area of Planes A, B, C, D, E Are First Determined

Plane A Area

See Fig. 8 calculation.

Interval is	38.35
	4
One-third	3 ⌋ 153.40
Area in square feet	51.133

Plane B Area

Ordinate No.	Ordinate Length in feet	Simpson's Multipliers	Function Totals
1	0.00	1	0.00
2	1.20	4	4.80
3	2.00	2	4.00
4	2.30	4	9.20
5	2.40	2	4.80
6	2.20	4	8.80
7	1.60	1	1.60
			33.20
Interval			4
One-third		3 ⌋	132.80
Area			44.266 square feet

Plane C Area

Ordinate No.	Ordinate Length in feet	Simpson's Multipliers	Function Totals
1	0.00	1	0.00
2	0.80	4	3.20
3	1.50	2	3.00
4	1.90	4	7.60
5	1.85	2	3.70
6	1.45	4	5.80
7	0.50	1	0.50
			23.80
Interval			4
One-third		3 ⌋	95.20
Area			31.733 square feet

Plane D Area

Ordinate No.	Ordinate Length in feet	Simpson's Multipliers	Function Totals
1	0.00	1	0.00
2	0.50	4	2.00
3	0.85	2	1.70
4	1.00	4	4.00
5	1.00	2	2.00
6	0.60	4	2.40
7	0.20	1	0.20
			12.30
Interval			4
One-third		3 ⌋	49.20
Area			16.400 square feet

Plane E Area

Ordinate No.	Ordinate Length in feet	Simpson's Multipliers	Function Totals
1	0.00	1	0.00
2	0.12	4	0.48
3	0.20	2	0.40
4	0.25	4	1.00
5	0.25	2	0.50
6	0.25	4	1.00
7	0.20	1	0.20
			3.58
Interval			4
One-third		3 ⌋	14.32
Area			4.773 square feet

Volume Part of Calculation

Ordinate No.	Areas	Simpson's Multipliers	Products
Plane A	51.133	1	51.133
Plane B	44.266	4	177.064
Plane C	31.733	2	63.466
Plane D	16.400	4	65.600
Plane E	4.773	1	4.773
			362.036
Interval between planes			0.5
One-third		3 ⌋	181.0180
Volume of Fig. 14			60.3393 cubic feet

The underwater bulk of any boat or of any irregularly-shaped body can be calculated by using this rule.

In the next issue of The Rudder I will explain calculations used to ascertain the center point of regular and irregular-shaped areas and volumes.

(*To be Continued*)



48-Foot Sedan Runabout, Designed and Building by the Great Lakes Boat Building Corp. for Logan Thomson. **(See Plans, Page 113.)**

Development of the Steam and Sail Yacht

By William Gardner, M. S. N. A. & M. E.

William Gardner, at the International Engineering Congress, held in San Francisco, read a series of papers on the development of the power, the sail and steam yacht, which goes back to the early days of each type of vessel. That on the power yacht was published in The Rudder last July. The articles on the steam and sail yacht, with illustrations by Mr. Gardner, are printed herewith, and will prove very interesting to all students of models and of designing.

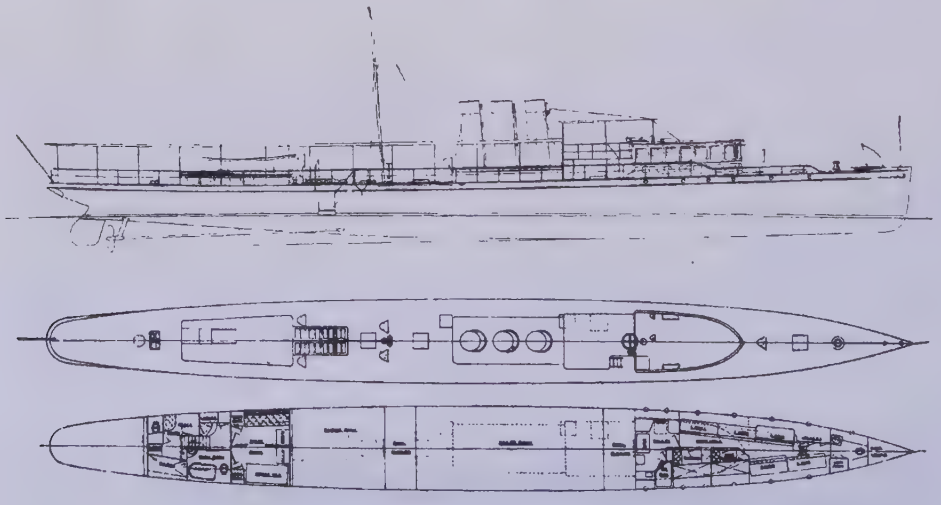
THE principal development of the American steam yacht has taken place since 1890. A few steel yachts were in existence at that time, and they were very good examples of their kind, but the majority were built of wood. The typical steam yacht of the day had an easy midship section, long fine ends, and low freeboard. A pilothouse was placed forward, and a cabinhouse aft, which ran over the machinery space and accommodations. It is needless to say they were not good sea-boats, and their cruising was confined mainly to protected waters. The auxiliaries, Sagamore and Sultana, boats of a different type, being about our only steam yachts to cruise offshore. In England, the moment a boat leaves a harbor, she is in the open sea. As a consequence, a strong seagoing type has been developed. It was useless to give a boat high speed, as it seldom could be maintained.

Here conditions are entirely different. We have the most beautiful yachting waters in the world. Long Island Sound, the Chesapeake Bay, the Hudson and St. Lawrence Rivers, the coast of Massachusetts and Maine, and thousands of miles of inland lakes and rivers give us waters that are ideal for cruising. Even the waters off our coast are seldom rough in Summer, and when they are, the numerous harbors close together give one plenty of places to run in before a sea can make up.

Many of our men of wealth have been closely confined to business, with their time for yachting limited. As a consequence, speed has frequently been a more important consideration than seaworthiness, and our smooth waters have made speed practical.

In the process of evolution, three types of steam yachts have been developed: the express yacht, the coastwise yacht, and the seagoing cruiser. The small steam yachts and fast launches of a few years ago are rapidly disappearing, none are now being built, the power boats having superseded them.

The express yachts are long and narrow, generally with the flat or torpedo-boat stern. The hulls are very light and beautifully built. The propelling power consists of twin screws, high-speed, triple-expansion engines or turbines, with light, small tube torpedo-boat boilers. They have small accommodations, the machinery taking up most of the space below. These boats have become



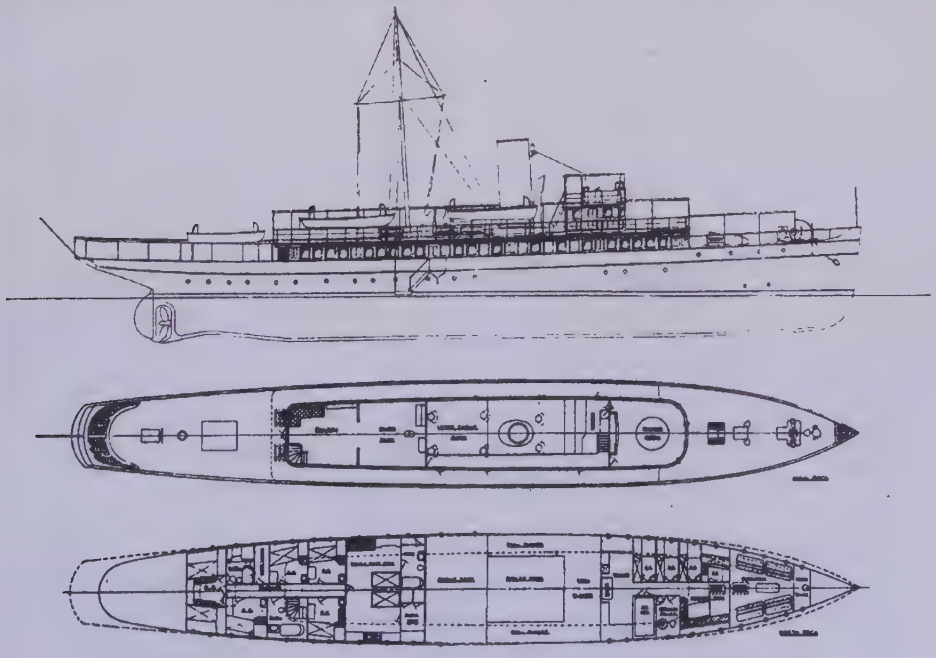
Express Type of Steam Yacht

very popular and are used principally for short cruises or to take the owner to and from his place of business and his country home.

The coastwise yacht has been the most popular type. The earlier ones had an overhanging bow and stern, fine lines fore-and-aft, a sharp, easy midship section, moderate breadth, and high freeboard. The deckhouses were of mahogany, of moderate size, and the boats were carried low. The construction of the hull was moderately light. The machinery consisted of triple-expansion engines, of high revolution, and the boilers were water-tube, of the torpedo-boat or the heavier screw-joint type. Speed was generally an important consideration. The bunkers and water capacity were small, and the stowage space limited.

Yachting in its earlier days was more of a sport than a recreation, and was indulged in principally by men. As the women became interested in outdoor sports and indulged in them, their interest in yachting increased, until it is now quite usual to see the wives and families of the owners aboard; the families in many cases living there for the entire season, thus making the yacht a floating home.

These changes of conditions have had their influence on design. The yachts have become more luxurious and comfortable. The saloons that were formerly below are now on deck. This has necessitated enlarging the houses. As the houses were enlarged, the promenade space on the sides became contracted, so the roofs of the houses were carried out to the side, forming a shade or promenade deck. On this deck, again, are often placed small houses, forming chart or smoking rooms. Ventilation has been given careful study, and it is now usual to have every room ventilated with an overhead skylight of the lean-to or A-frame type. Artificial ventilation is resorted to as well in many instances. The electric light plants have necessarily increased with the accommodation, and, added to the general lighting, there are often powerful searchlights and decoration belts, as well as large storage batteries. The plumbing has become more elaborate, porcelain or china replacing enameled iron. Many boats are also supplied with some form of cesspool system, the Hermes being very popular. As the boats are often out early or late in the season, a more elaborate system of heating has been required. As owners find they can absent themselves longer from business, their cruises have naturally become longer, so the bunker capacity has had to be increased. For the same reason, an elaborate cold-storage plant has become necessary. No yacht is well equipped without two launches. The Government now requires heavy life-boats, and there must be smaller boats for general use. A greater quantity of stores and water are also required. The task of the naval architect has become more and more difficult, as all of these improvements have meant additional weights and nearly all of these weights have been high up. To carry these weights and get the proper stability, it has been necessary to increase the breadth, fill the midship section, and fill the ends. In many cases these changes have been made without a very great increase in resistance, due to



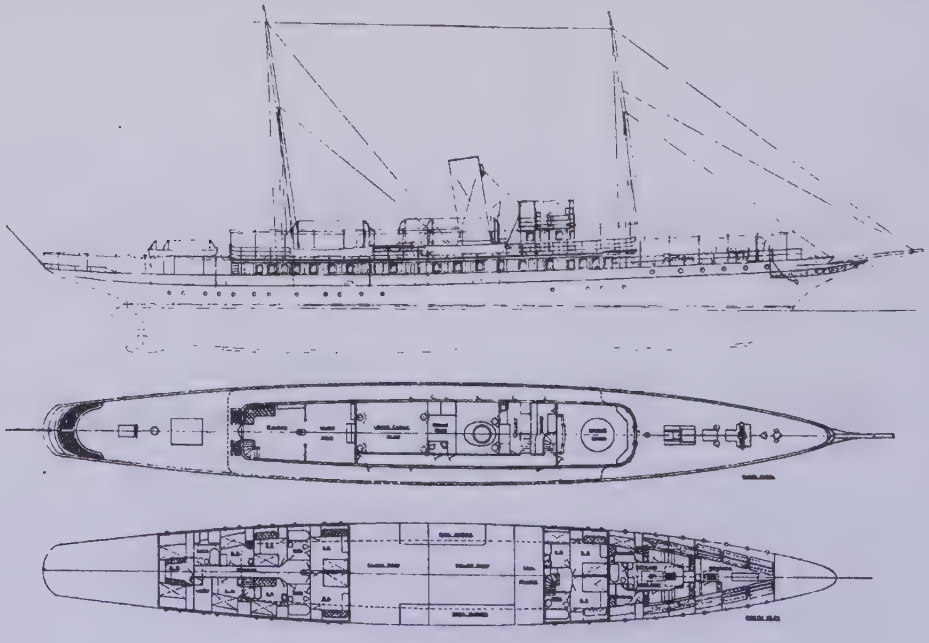
Modern Coastwise Steam Yacht

the very valuable experience gained from the experimental model tank at Washington. Ballast is not usual, but is sometimes carried, when a disturbance of the accommodation desired by the owner is of more consequence than the slight additional weight to trim, or when a slight adjustment of weights is necessary for steadiness in rough water. Weight is sometimes saved, when ease in a seaway is not the first consideration, by giving the yacht a straight stem and short stern. Heavy spars, for the purpose of carrying sail, are going out of use. The clipper-bowed boats have two pole masts of moderate dimensions, while the straight stems are generally accompanied with a single signal mast, with a square yard.

As the yachts are becoming more comfortable and luxurious, the demand for high trial-trip speeds is disappearing. The first cost and the cost of maintenance is much greater than it used to be, so coal economy is becoming an important factor. Yachts are seldom run at their maximum speed, and when they are, are under forced draft. The result has been that for the occasional satisfaction of beating another boat or making a fast run, the general cruising must be done under conditions that are far from economical. The boiler under natural draft is not suitable to the engine. The pressure being low, no advantage can be taken of steam expansion, and the one or two low-pressure cylinders do no work and are a drag. The clearances are unnecessarily large and the auxiliaries excessive and extravagant. For the well-designed boats of today, where the owner has allowed it, the boiler power has been increased, the sizes of the cylinders and the clearances decreased, and the stroke made longer. Twin-screws are frequently used, as well as the four-cylinder triple-engine. While the Scotch and the large-tube water-tube boilers occasionally appear, the tendency is towards the small-tube or screw-joint type.

The improvements made in the coastwise yacht apply in an even greater degree to the seagoing cruiser, the two types now having many similarities. In the seagoing yacht, of course, the first consideration is safety, and ease and steadiness at sea. In the best designs, moderately long overhangs are the rule. A great deal of buoyancy is contained in these ends, especially with the full water-line now used. The overhang bow cuts the water easily and lifts the bow at the same time, making it possible to drive the boat with comfort much faster against a head sea than could be done with one having a straight stem. The after overhang is also very effective when running or with a quartering sea. Fortunately, we are not hampered by the various conditions that influence and control the design of a merchant vessel. We can give any form of midship section we please, and any form of fore-and-aft lines. The proportionate buoyancy above water is much greater in a steam yacht than in a merchant vessel, and the heavy weights are well concentrated amidships. And again, the variable weights, principally coal and water, affect the metacentric height very little. Bilge keels are also used, and are made large and very effective. As a consequence of these things, it is possible to produce a boat of exceptional ease, steadiness, and dryness in a seaway.

The sub-division is now receiving its proper attention. The usual practice is to have six or seven watertight



Seagoing Steam Yacht

bulkheads. First, is the collision; second, at the after end of crew's quarters; third, at after end of officers' quarters; fourth, forward end of boiler room; fifth, between engine and boiler room; sixth, at after end of engine room; seventh, after collision. A watertight door is usually placed between engine and boiler room, and another from engine room to shaft alley.

In the past, our designers have been criticised for the lightness of their construction, and this, with some, maintains today. A few boats have been classified by Lloyd's and other societies, but they have been the exception and not the rule. That our designers have been justified in the scantlings they have used, from the point of structure, has been proved by the very few, if any, structural weaknesses that have developed. The writer has found Lloyd's Rules in excess of the strength necessary, and in several yachts, the bending moments of which he worked out, the maximum stress was well below the amount considered safe for merchant vessels. In spite of this, however, many of our yachts have been too light, as they have seriously lacked durability, and the tendency, I am glad to say, is to use Lloyd's Rules throughout, or at least in the bottom plating and those parts most liable to corrosion. The weakest part of the boat is undoubtedly the watertight bulkheads, and these, in the future, should be given very great consideration, both in the scantlings and in the workmanship.

We have been very fortunate in regard to the materials available for construction. The Navy Department has demanded very high quality for its use and has developed the manufacture of it. We have, in consequence, been able to obtain this high-grade material at a reasonable cost. It is several years since the writer has built a steam yacht the plating of which has had an elongation of less than 25%, and seldom less than 27%. This material, combined with carefully laid-out double-riveted edges and treble-riveted butts, makes a hull that is remarkably safe from serious damage. Such hulls have been severely rammed, or have been ashore, when a dozen or more plates had eventually to be removed. They have also received other severe damages, but have always reached home, sometimes hundreds of miles away, without serious leak and without the cracking of a single plate.

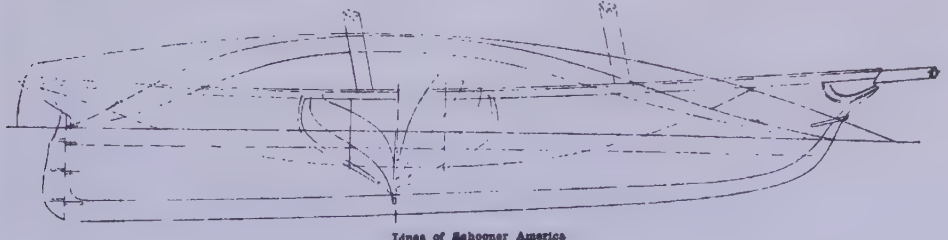
In the seagoing yacht, steaming radius is a very important consideration, consequently, large bunker capacity is necessary. It was formerly the practice to carry large quantities of coal on deck when starting on a long voyage, but this is very objectionable, as it raises the center of gravity and makes a bad sea-boat. For the same reason, coal economy is very important. Boilers are, in consequence, made large and the engines have been adapted to the speed desired. Maximum speed is not now important and seldom exceeds 2 knots over the regular cruising rate. Scotch boilers are very popular for this use, but the heavier type of water-tube is coming into favor. In the smaller boats, the latter has a decided advantage; there is more room for coal and the smaller weight makes a very much better sea-boat. There is no objection to the use of water-tube boilers in this country, as our engineers are all accustomed to their use and have no trouble handling them. The long-stroke, triple-expansion engine, with three or four cylinders, and the Stephenson link gear are customary. The auxiliaries are independent—American practice differing materially from the English in this respect.

What the future may bring forth is hard to tell. One thing is certain, however, that as our wealthy men become more accustomed to yachting, their requirements become more rational and practical, and the seagoing and cruising qualities of the boat become more important than arrangement of accommodation. The designers, thus encouraged and assisted, are sure to advance and improve, and their production, I feel sure, will be a credit both to their country and themselves.

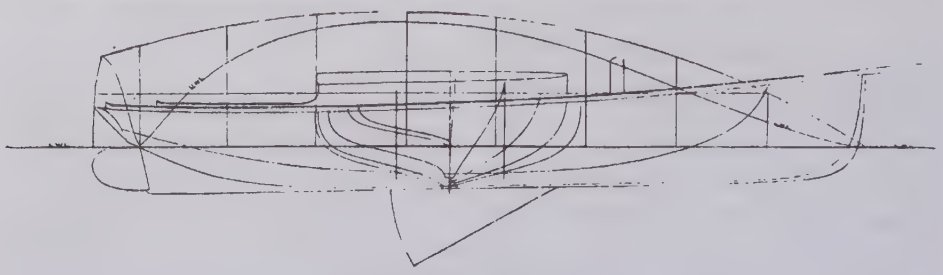
The Sail Yacht

In taking up the development of the American Sailing Yacht, I will start with the schooner America, 1851, as this was the first boat to give us an International reputation in yacht designing. The America and her sisters, the Una, and Mary Taylor, all from the board of George Steers, started a new era in the form of models. Before this, yachts were built with the cod's head and mackerel tail. The bows were short, full and bluff, and the sterns long, and often fine. The America and her sisters were given long, fine bows, 55% to 60%, and correspondingly short, but fine sterns. This change brought the center of buoyancy farther aft and produced much faster boats, especially to windward. The angle of entrance was finer, and the lee side easier and more effective in holding on. Better sea-boats also resulted. The ballast coming further aft, caused a concentration of the weights and brought the center of gravity of the hull and ballast in nearly the same vertical line. This distribution of bow and stern became universal in all types and has remained to the present day.

The America was a keel boat, of good draught, full midship section, and generous displacement. She had a decided drag to her keel, which brought the center of her lateral plane and the center of effort of her sails well aft, in their proper place. This combination produced a perfect balance and made a boat easy to steer under all conditions. As a result of her success, a distinct type was established in the larger class and she was soon followed by such splendid boats as Sappho, Dauntless, Dreadnought, Rambler, Enchantress, and others. In fact, some of the large racing and most of the large



Lines of Schooner America



Typical Centerboard Boat of the 70's

cruising boats of a few years ago differ from her very little in model, longer ends and the changes incidental to refinements in ballasting and rig being the principal ones.

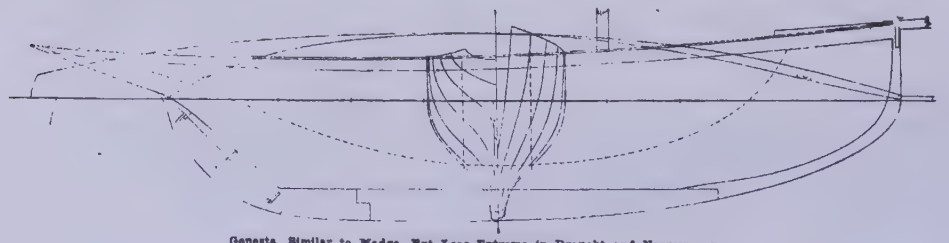
After the America another type came into existence. These were known as the centerboard boats. So many were built in all sizes, they were eventually looked upon as the national type. Their principal characteristics were short overhangs, good breadth, moderate draught, and a large centerboard to prevent leeway going to windward. As time went on, the breadth was increased to give sail-carrying power, and the draught decreased, probably to reduce surface and make an easier form down wind; at the same time, freeboard was decreased to save weight. To get headroom, cabinhouses were placed over owner's accommodations. There was a great prejudice against outside ballast, as it was thought that it made the boat loggy, so all ballast was stowed inside. These boats had great initial stability, carried large rigs and were very fast in smooth water and down wind.

In the races for the America's Cup, the centerboard has played a very important part. In the race sailed in 1870 against the schooner Cambria, the centerboard schooner Magic won. In 1871, in the race against the schooner Livonia, the centerboard schooner Columbia won the first, and the keel schooner Sappho won the other two. In 1876, the centerboard schooner Madeline defeated the schooner Countess of Dufferin, and in 1881, the centerboard sloop Mischief defeated the sloop Atalanta. The Puritan, Mayflower, Volunteer and Vigilant were also centerboards, while the Defender, Columbia and Reliance were keel.

The New York Yacht Club confined itself to cabin boats only. In the smaller clubs, a very interesting class developed. They were open boats and were known as "sandbaggers." They had separate rules both for measurement and sailing. For time allowance, they took either a mean length, viz., half the sum of the over-all length and load water-line, or a given distance above the load water-line. Shifting ballast was allowed, with no limit to the crew. The result was a plumb-ended, broad, shallow boat of small displacement, light hull and enormous sail plan. They required exceptional skill to sail, and furnished great sport; capsizes were frequent, but they seldom sank, as the sand bags generally went overboard. These boats have now disappeared.

In the cabin classes, various rules of measurement for time allowance were in vogue between 1851 and 1883. Sometimes each club had a separate rule of its own. Just what effect these rules had on design, it is difficult to tell. Displacement was used at one time and cubic contents another. The former would encourage small displacement and the latter low freeboard—both of which existed. Whatever the cause, the shallow-draught type developed, and as it progressed, the initial stability became greater, while the range decreased. In 1876, the Mohawk, 121 feet load water-line, 30 feet 4 inches breadth, and only 6 feet draught, capsized in New York Harbor, drowning her owner. This accident drew public attention to the undesirability of the type and the necessity of better measurement rules.

In 1881, James Coates, Jr., sent the keel cutter Madge from Scotland to this country to race. Much to the surprise of everyone, she was successful. The Madge was built to take advantage of the English measurement rules, and she raced successfully there before coming here. She had a load water-line length of 39 feet 6 inches, a breadth of 7 feet 6 inches, and a draught of 8 feet. Her midship section was full, and her displacement heavy. All her ballast was lead in one piece, fastened on the outside, and her hull was very light. While she was safe and non-capsizable, she was wet in rough water and cramped in breadth. Her success was due to her ballasting, to the great refinement of hull construction, rigging and sails, and to the excellent way in which she



Genesta, Similar to Madge, But Less Extreme in Draught and Narrowness

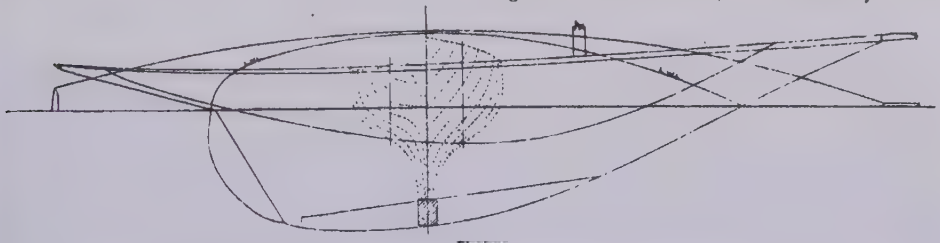
was handled. Her influence on yacht designing was greater than that of any boat since the America. The country was ripe for a change in type. She demonstrated that a boat could have a large displacement and be absolutely non-capsizable and still be fast. It was appreciated by those yachtsmen who studied the races that she was the development of the English rule that penalized breadth, and they believed that a faster and better type, equally safe, could be developed, provided measurement rules could be devised to encourage such a type.

In 1883, the New York and Seawanhaka-Corinthian Yacht Clubs adopted a length and sail-area rule. The New York formula was $\frac{2L + \sqrt{S A}}{3}$ and the Seawanhaka $\frac{L + \sqrt{S A}}{2}$, where L = load water-line and S A = sail area. The boats were first classified by the corrected length, but shortly afterwards, for the sake of uniformity, were classified by load water-line only. The time allowance adopted was 50% of the theoretical, it being assumed that the speed of boats varied as the square roots of their load water-line lengths. With this change in the measurement rules, the type of boat changed. Our designers did not follow the Madge model closely, but gave the boats a generous breadth and draught, coupled with a wholesome freeboard and displacement. At the same time, the rig, sails and ballasting were refined.

In 1885, Sir Richard Sutton challenged for the America's Cup with the cutter Genesta. This boat was of the same type as the Madge, having been built to suit the same measurement rules. To meet her, Mr. Burgess designed in the Puritan a boat of the new type. She had less breadth, and more draught and displacement than the typical sloop, but on the other hand, was wider and shallower than Genesta. Her ballast was nearly all on the keel. She thus had both natural and artificial stability. While her draught was less than Genesta, her large centerboard gave her ample holding-on power. Above the deck, the complete English cutter rig was adopted.

The succeeding Cup boats, Mayflower and Volunteer, were of this type, but were given greater length and draught.

In 1889, the famous 40-foot class was started. This class was the beginning of the first keen class racing. These boats were nearly all of the keel type, with good breadth, deep draught, heavy lead keels, and enormous sail area. Among this fleet there suddenly appeared a clean-lined, graceful boat, moderate in dimensions and sail area, but far more beautiful than any of the others, and she proved the fastest of the fleet. This boat was the Minerva, designed by Fife, that had come from England on her own bottom, and was sailed by the now famous Charlie Barr. She represented the English idea of a compromise type, having greater breadth and draught than Madge, with less displacement.



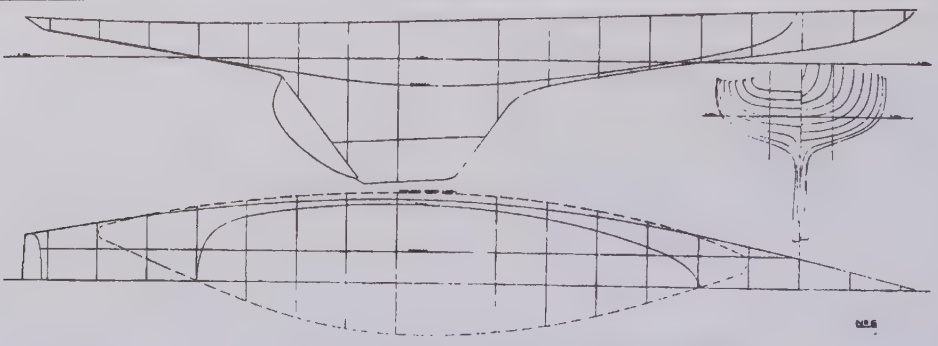
Gloriana

In 1891, a new class, the 46-footers, was formed. These boats, generally, showed the influence of the Minerva. Among them, however, the Gloriana soon appeared. This boat, the product of N. G. Herreshoff, and the forerunner of his successful Cup Defenders, introduced entirely new principles in design. Her water-line length was 46 feet and her over-all 71 feet, about 9 feet longer over all than any of her competitors. She had no forefoot whatever, but had a long side, with a comparatively full load water-line. Her breadth was slightly less than the others and her draught about the same, but her overhangs were lower, and when she heeled, had a listed water-line much in excess of 46 feet. The water went under her rather than around her, and the long side gave her great stability. This, coupled with an extremely light and refined hull and rigging, made her a phenomenal success.



Dilemma

In this same year Herreshoff brought out another boat,

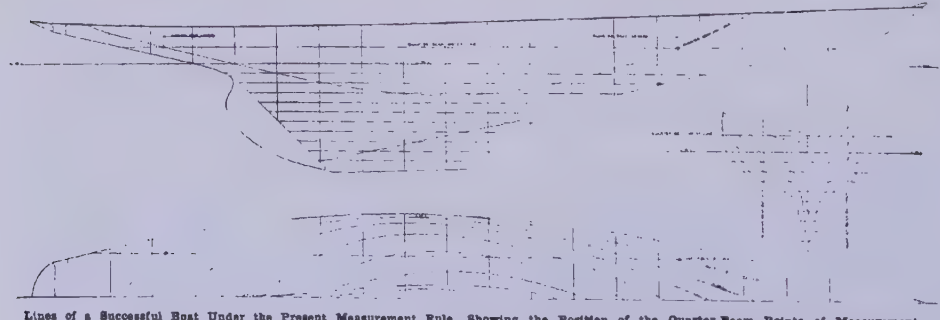


Lines of a Successful Boat, Showing the Compromise Between Gloriana and Dilemma

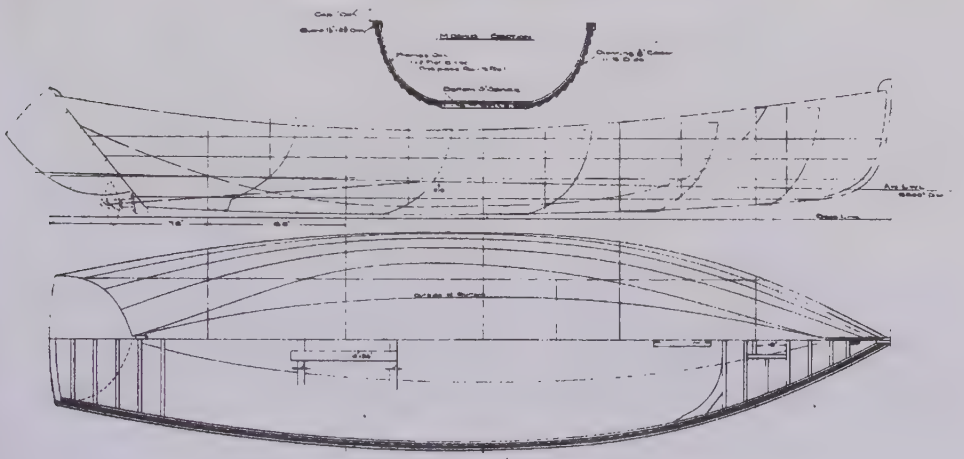
the Dilemma, quite as original in design as Gloriana, and possessing many of her features. The displacement, however, was very much less and the hull much shallower. Attached to the hull was a bronze plate fin, and at the bottom of this fin, a lead bulb. These two boats had a decided influence on the designing for some time to come. The fin keels eventually dropped out. Their influence, however, remained and was noticeable in the extreme thinning of the keel halfway between the hull proper and the lead, as shown in Defender, Columbia, Reliance, and many others.

In 1890, the New York Yacht Club adopted the Seawanhaka rule, viz., $\frac{L + \sqrt{S} A}{2}$. The rules were now uniform in all the important clubs. The adoption of the Gloriana form, coupled with refinement of construction, made it advantageous to take large sail areas and give the time allowance. As a consequence, the rule was changed in 1896, so that all boats were classified by corrected length. This eliminated time allowance between boats built to the top of a class. As was anticipated, the new boats were built longer on the water-line, with finer and easier hulls, and a much smaller sail area. The rule, however, was not yet perfect; it had its loop-holes. Designers had not forgotten the value of sail area. As length was measured on the load water-line, it was soon found possible, by filling the water-line and lowering the overhangs, to increase the listed length. The load water-line was consequently shortened, displacement reduced, and the sail area increased. The Cartoon, one of the most extreme, had a load water-line length of 25 feet, and a breadth of 10 feet upright. When listed, she had a heeled water-line of 47 feet and a breadth of 5 feet 3 inches. As this rule evasion continued, the type of boat deteriorated until it became almost impossible to hold the hulls together in rough water, the pounding was so great. It was evident that a decided change must be made in the rules to save yacht racing, and the change must be of such a nature that a wholesome boat would be produced and rule cheating prevented. A great deal of study and investigation was given the subject, and the best authorities on both sides of the Atlantic were consulted. As a result, in 1903, the present rule, slightly different in form, but essentially the same, was adopted.

The rule as it now stands is, Rating = $.18 \frac{L \times \sqrt{S}}{\sqrt[3]{D}}$ where L = load water-line; S = sail area; D = displacement in cubic feet. The rule is protected from evasion by limitation. To prevent excessive listed length, a measurement is taken parallel with the L. W. L., 10% of the water-line breadth above L. W. L., and ¼ of the L. W. L. breadth out from the middle line. If this exceeds $(100 - \sqrt{\text{L. W. L.}})$ per cent of the L. W. L., half the excess is added to L. W. L. in the formula. If draught exceeds 16% of L. W. L. + 1.75, such excess shall be multiplied by 3 and added to rating. If $\sqrt[3]{D}$ exceeds 20% of L. W. L. + .5, such excess of displacement shall



Lines of a Successful Boat Under the Present Measurement Rule, Showing the Position of the Quarter-Beam Points of Measurement



Lines of Seabright Dory

A small generator in the engine room furnishes current for cabin and running lights. The equipment is in every way complete and up to first-class yacht standards. The number of inquiries which this and other boats of her type have called forth is astonishing, and it is not unlikely that many more will be turned out.

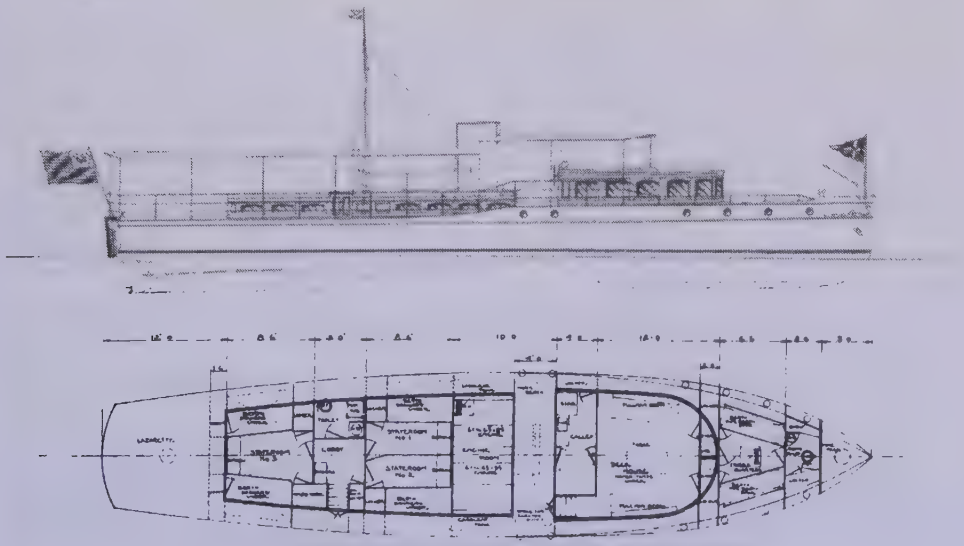
The principal dimensions are:

Length o. a.	40	feet	0 inches
Length w. l.	36	"	0 "
Breadth	10	"	8 "
Draught	2	"	6 "

75-Foot Cruiser

The cruiser shown herewith is a recent design of the New York Yacht, Launch & Engine Company, of Morris Heights, N. Y. The fore-and-aft dimensions are clearly shown. The interesting features to the observer are the large and well-ventilated deckhouse forward, the generous breadth and well-balanced proportion of the profile.

The crew's quarters and toilet are shown forward with a passage under deckhouse leading to engine room. The owner's quarters consist of three large staterooms



75-Foot Power Cruiser Designed by the New York Yacht, Launch & Engine Company

with berths 4 feet wide, a large lobby and toilet. The finish in owner's quarters is in white, with mahogany trim. The finish in deckhouse is of mahogany.

The engine room and fuel tanks are located amidship. Two six-cylinder, 6½ by 8½ 20th Century engines driving twin screws are installed. A direct-connected electric plant will also be installed in engine room to furnish electric lights throughout the yacht.

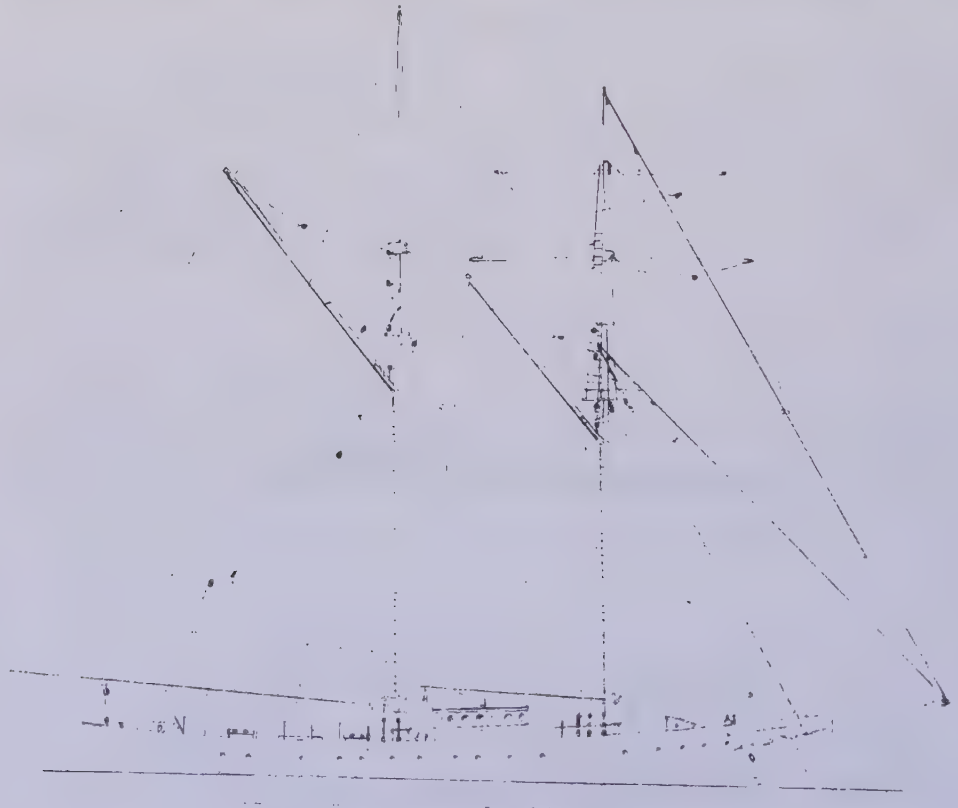
The general dimensions are:

Length	75 feet 6 inches
Breadth	13 " 6 "

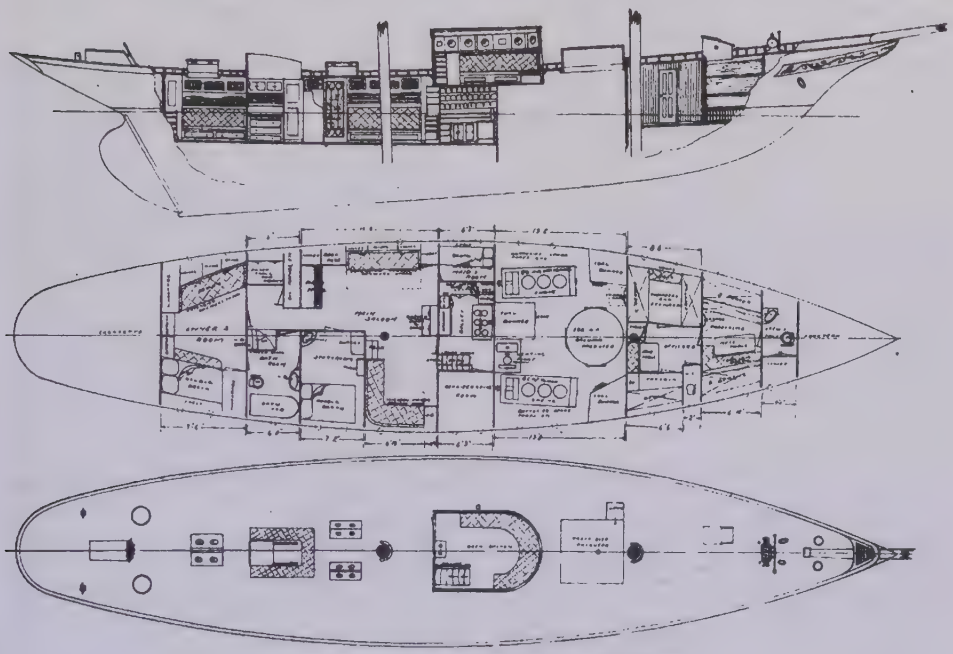
100-Foot Seagoing Auxiliary

Undoubtedly this layout will seem a litle unusual, and it is. William J. Deed, Jr., naval architect, Boston, Mass., has recently designed this little vessel for a client who intends to make extended ocean cruises with a limited party, consisting practically all the time of himself, wife and child, with a maid, and only occasionally entertaining two or three guests; so Mr. Deed has planned a floating home without attempt to accommodate a large number of people in staterooms, rather laying out a large living room in the widest part of the boat, with all the other rooms opening off this. He has also added a very attractive deck saloon with stairway leading direct from the main cabin or living room; there is also a main companionway aft of the deckhouse, this companionway landing one where any room is readily reached without passing through any other. For seagoing work the chart table is convenient to the man at the wheel and wet coats, oilers, etc., can be hung in the clothes closet directly at the foot of the stairway. The arrangement of the quarters is readily seen from the plans and attention is called to the privacy which every room is given and to the convenience the plan affords for living aboard a boat for long trips. There is a large refrigerator room off the galley where an immense store of food and provisions can be kept and the galley is completely equipped.

The auxiliary power will consist of two 80-h.p. Wolverine engines and a Galusha producer gas plant, all the machinery including an independent lighting plant, and the coal bunkers are located between two watertight bulk-



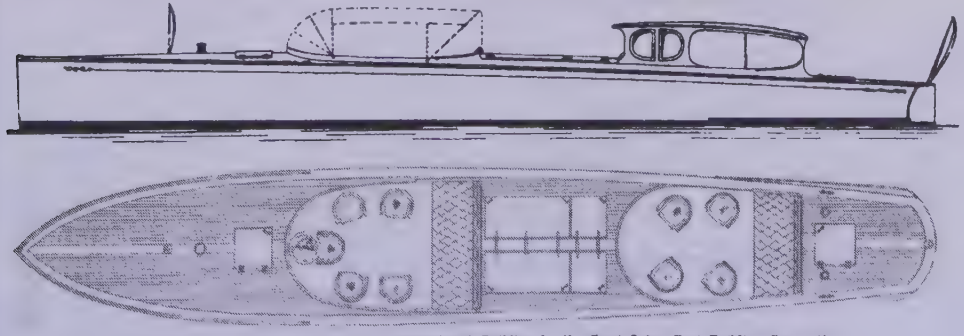
100-Foot Aux. Seagoing Topsail Schooner, Designed by Wm. J. Deed, Jr.



Arrangement Plan of 100-Foot Aux. Seagoing Topsail Schooner

heads, and the power plant can be operated very economically and on fuel that can be picked up anywhere around the world. Forward of the machinery compartment are the quarters for the officers and crew, and the latter being natives, it was not necessary to lay out extensive quarters.

It will be noted from the sail plan that a rig suitable for long voyages especially in the trade winds has been provided in a brigantine rig, also that the clipper bow has been retained with a pole bowsprit, as the designer believes that the bows will be lifted to a sea better with this plan than with a knockabout rig having less lift to the headsails. The hull will be built along the same lines as the Gloucester fishermen, and the ballast will be arranged 50% inside and 50% outside, as this makes for a more comfortable boat at sea than the modern schooner with all the weight outside. The finish will be up to the minute with mahogany and teak trim, and she represents a type of auxiliary that is very attractive. There is 7 feet headroom in the quarters and 6 feet 4 inches under the deck saloon. She is 101 feet over all, 22 feet breadth of planking, and 12 feet draught.



48-Foot High-Speed "Sedan" Runabout, Designed and Building by the Great Lakes Boat Building Corporation

48-Foot High-Speed Sedan

Logan Thomson, of the Champion Coated Paper Company, of Hamilton, Ohio, who make the Government post cards and a large percentage of the coated paper used in the world, is a speed enthusiast; he has been so for a good many years. Mr. Thomson bought one of the first eight-cylinder marine engines ever built and installed it in a 35-foot runabout and had one of the fastest displacement boats in the country. He ran this outfit until it practically disintegrated.

Last season he and his brother built a big express cruiser with a pair of eight-cylinder 5½-inch by 6¾-inch engines; this, however, didn't go fast enough for Mr. Logan; furthermore, a boat like that had a crew on board and he didn't have the free hand to fuss with the engines as he used to have in the old days of the original eight, so decided to get for himself another runabout. He consulted with the Great Lakes Boat Building Corporation, of Milwaukee, and eventually placed a contract with them for a 48-foot wave-collecting type Sedan to be powered with an eight-cylinder Duesenberg, 6¾ inches by 7¾ inches, developing 400 h.p. at 1,500 r.p.m., and it is fully expected that a speed of 38 to 42 miles per hour will be obtained.

The arrangement plan of this rather remarkable boat calls for a cockpit forward and aft of the engine compartment, the former to be protected by a melon or Cape Cod hood and the latter by a permanent Sedan type cabin, with windows which drop down into pockets. The boat will be constructed of double-planked mahogany with white enamel decks. The Great Lakes Boat Building Corporation designed this boat in their department of special designs, and it will be built in that part of their shop devoted to special designs, nothing being allowed to interfere with that part of the shop that builds the standardized 40 and 50-foot military type express cruiser, a large number of which are now under construction, this stock model having met with great popular favor.

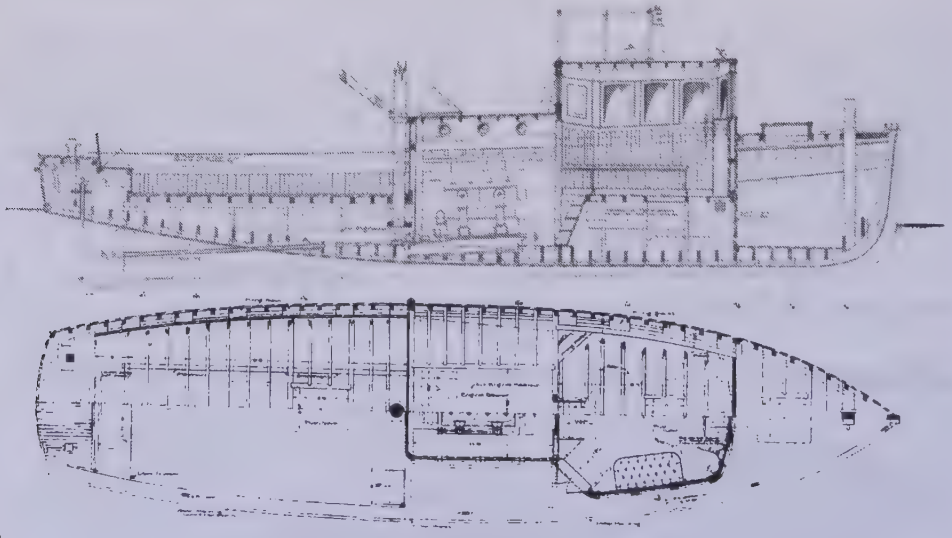
42-Foot Shipchandlery Boat

The shipchandlery boat Marienita, designed by Cox & Stevens, for Henry A. Kessel & Co., of New York, and built by E. J. Ellis & Sons, Tottenville, S. I., is shown in the accompanying plans.

The requirements covered a boat for use in New York Harbor, making the rounds of vessels at anchor in the morning and delivering package freight to the extent of six tons later in the day. On account of competition and the likelihood of carrying small parties, it was necessary to develop a speed of at least 10½ miles per hour when light and to have a dressy and businesslike appearance; also to play the rôle of work boat to advantage.

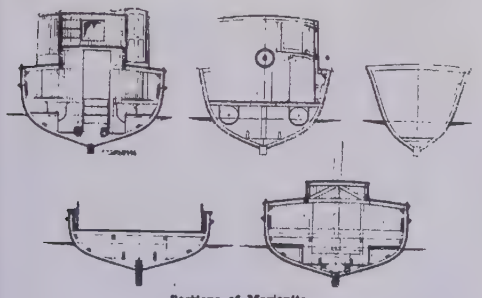
That the designers have worked out a happy combination of the required elements is evidenced by the fact that the boat has given steady and satisfactory service since last July. The slightly raised forward deck, flaring bow sections and ample deadrise give the necessary seaworthiness for possible Winter work in the lower bay or off Sandy Hook. The little pilothouse with raised floor affords seating accommodation for about six persons, and will be heated in Winter by a small coal stove. The engine room is ventilated by two ports on each side of the trunk and two in the after bulkhead, and is accessible from the pilothouse or the raised deck by means of a hatch in the trunk.

Two gasolene tanks of a capacity of 50 gallons each are located under the pilothouse floor, where their weight helps to trim the boat when loaded. Before launching a w.c. was installed in the forepeak and an ice-box under the cabin floor. These are not shown in the drawings.



Marienita, Shipchandlery Boat, Designed by Cox & Stevens

The entire cockpit is for cargo, which is to be moved by means of the small boom. The deck is covered with loose gratings and the coamings shod with half-round galvanized iron. A "pulpit" of galvanized iron pipe has been arranged on top of the pilothouse; while this does not add to the yachty appearance, it provides an excellent position in heavy weather from which the firm's representative may communicate with those on a steamer's deck.



Sections of Marienita

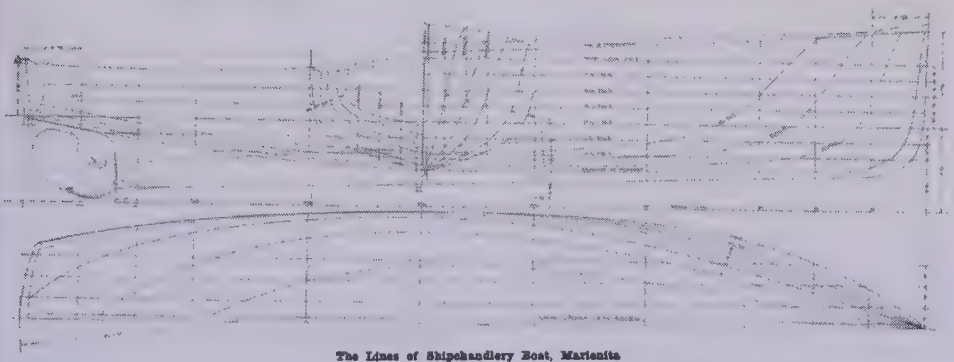
The engine selected was a four-cylinder Standard, 6 by 8 inches, rated at 32-37 h.p. With a Standard wheel 32 by 34 inches, turning 410 r.p.m., the boat made 11 statute miles per hour.

The general dimensions are:

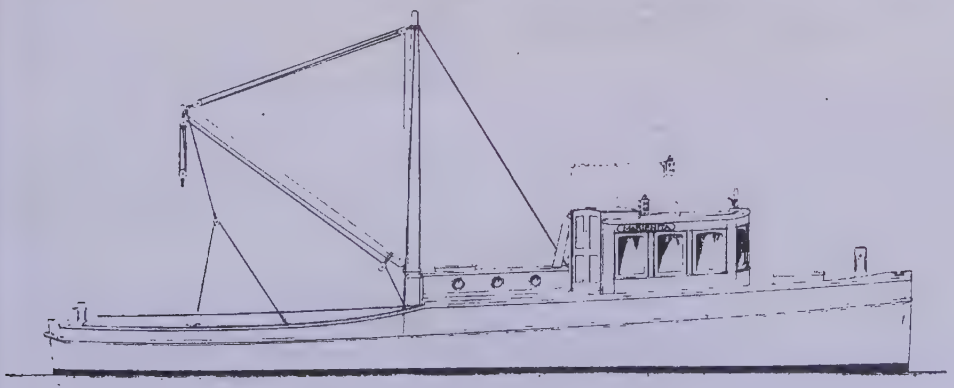
Length o. a.....	42 feet 0 inches
Length on mean l. w. l.....	41 " 6 "
Breadth, extreme	10 " 6 "
Draught, mean	3 " 9 "
Displacement, mean l. w. l.	24,000 lb
Displacement, light	19,800 lb

44-Foot Knockabout Schooner

H. C. Corson, of New York and South Ingonish, Cape Breton, N. S., has had a 44-foot water-line knockabout schooner designed by B. B. Crowninshield, which he will use next season off Cape Breton. The requirements of Mr. Corson were, ability to stand hard weather and keep going, a small, easily handled rig, a boat that would not heave out when laid well over, simply and strongly built, mostly inside ballast, no frills in the cabin, but everything plain and serviceable, more of a little ship than a yacht. A place has been provided for an engine in



The Lines of Shipchandlery Boat, Marienita

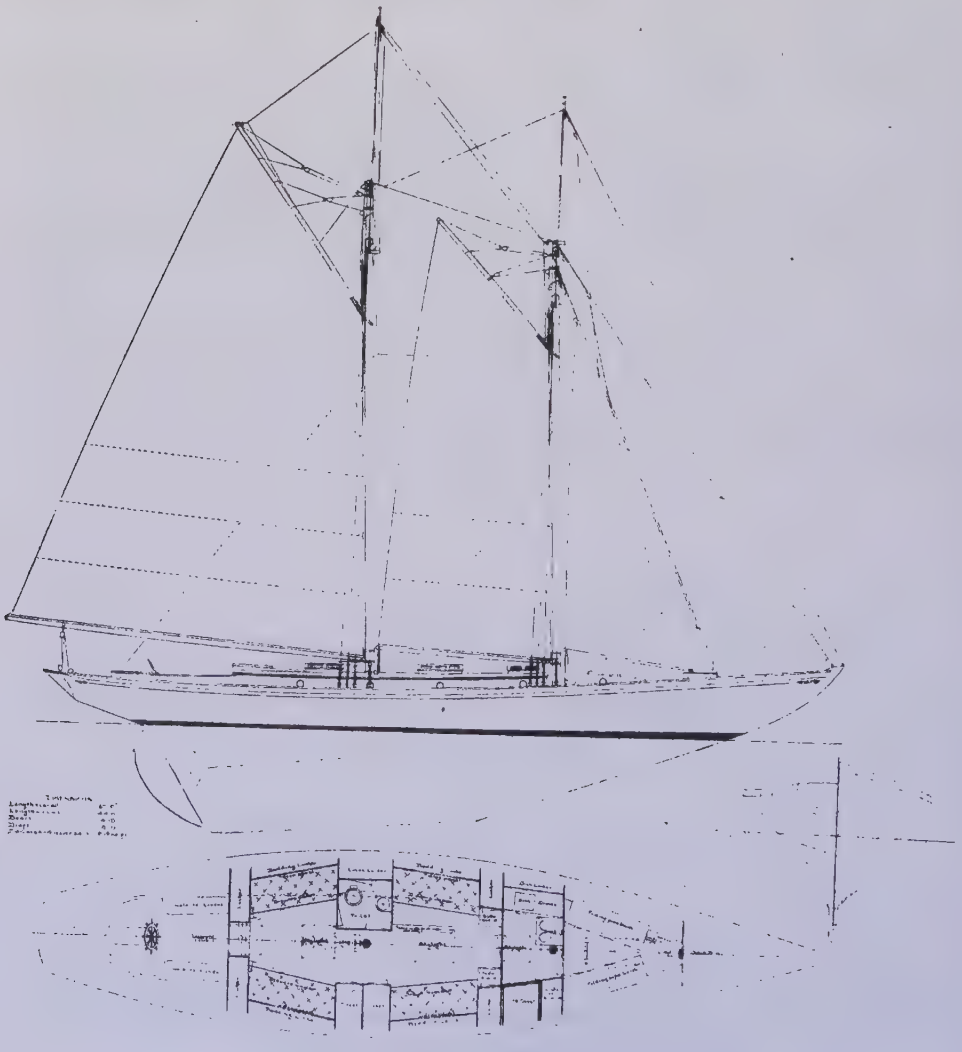


Outboard Profile of Shipchandlery Boat, Designed by Cox & Stevens

case her owner wishes an auxiliary, but no engine will be installed at present as Mr. Corson is a sailor of the old school.

The cabin was laid out in accordance with the owner's ideas, derived from his experience in other yachts he has owned. There is a roomy, bright and comfortable interior, which can be readily divided into two cabins, if desired, by a curtain arranged just aft of the mainmast. This arrangement leaves the toilet room accessible from both cabins. The engine, which will be of 20 h.p., will extend only two feet above the floor and can be covered by a folding chart table which folds up against the bulkhead when it is necessary to get at the engine. The general dimensions are:

Length o. a.	60 feet
Length l. w. l.	44 "
Breadth	14 "
Draught	8 "
Sail area	1,219 square feet



44-Foot Water-line Knockabout Schooner, Designed by B. B. Crowninshield

Happenings in the Yacht Clubs

Seawanhaka-Corinthian Y. C.

THE annual meeting of the Seawanhaka-Corinthian Y. C. was held in the Harvard Club, New York, on Tuesday, January 9th. Reports submitted to the members showed that the club was very prosperous and that last season was an exceptionally good one. The attention of the members was called to the Fish Class, and although twenty-one were built last year, efforts are being made to add to this fleet. The committee reported that the boats "have proved so safe, comfortable and seaworthy in varying weather conditions that they are ideal for teaching children to sail, for pleasure sailing and Saturday racing." The price of one of these is now $925 if three are ordered. If eight are ordered the price will be $900. William H. Appleton, 111 Broadway, New York, is secretary of the class.

The election of officers resulted as follows: Commodore, Howard C. Smith, schooner Zahra; vice-commodore, George Nichols, sloop Carolina; rear-commodore, Gherardi Davis, sloop Alice; secretary, Henry F. Atherton; treasurer, Albert Strauss; measurer, Alexander M. Orr; trustees (class of 1920), Clinton Mackenzie, Charles J. Nourse, Willis D. Wood; race committee, Daniel Bacon, Clinton Mackenzie, De Forest Hicks, Harry L. Maxwell, Horace E. Boucher; committee on lines and models, John Hyslop, Jonathan Thompson, Alexander M. Orr; law committee, Eliot Tuckerman, William A. W. Stewart, Gherardi Davis; committee on steamship and navigation, George M. Bodman, Arthur Curtiss James, William J. Matheson, Willis D. Wood.

Eastern Y. C.

The Eastern Y. C., at its annual meeting held at the Algonquin Club, Boston, on January 9th, amended its racing rules to meet the trouble caused by errors in measurement found last year. The rule on displacement now reads:

"Displacement of yachts in Classes Q, R and S to be obtained by weighing, and in Class P by taking off the lines and proceeding as described below for calculation by Simpson's Rule. Displacement of yachts in other classes to be obtained by weighing or as follows:

"When the lines have been taken off a Class P yacht in any after her first racing season, the lines so taken off shall be good for that and the racing seasons of the next four calendar years. In case of serious accident to the hull of any yacht, and subsequent repairs, which in the opinion of the Regatta Committee are likely to have changed her form, her lines shall be taken off after repairs are made.

"When the lines of a yacht are to be taken off, the work shall be done by a person designated by the head of the Department of Naval Architecture and Marine Engineering of the Massachusetts Institute of Technology. The lines so obtained shall be sealed and placed in the custody of the head of said department, and shall be open to inspection only by the official measurer of the club."

The final amendment to Rule 1, under "Remeasurement," makes paragraph (a) read: "(a) At the expiration of two years from date of last certificate, except in Class P, in which yachts shall be remeasured and a new certificate issued each season before a yacht may take part in races."

Secretary Henry Taggard, in his report, showed that the club now has a membership of 638, a gain of 9 since January 1, 1916. Members of the club own 291 yachts as follows: schooners, 52; sloops and yawls, 62; steam yachts, 35; power yachts, 71; yachts under 30 feet waterline length, 71.

The officers and committees elected for the present year are: Commodore, Herbert M. Sears; vice-commodore, Maximilian Agassiz; rear-commodore, John S. Lawrence; secretary, Henry Taggard; treasurer, Stephen W. Sleeper; members of council, Charles F. Adams and Frank B. McQuesten; regatta committee, John Sears Harrold, Caleb Loring, Frederick M. Hoyt, Henry A. Morss, and A. Loring Swasey; committee on admissions, Edward William Atkinson, Theodore Jones, Parkman Dexter and Robert A. Lesson; house committee, B. Devereux Barker, Guy Lowell, James A. Burgess, Francis A. Seamans and Daniel K. Snow.

Corinthian Y. C. (Marblehead)

At the annual meeting of the Corinthian Y. C. (Marblehead), held January 10th in the house of the Boston Athletic Association, the following officers were elected: Commodore, Charles B. Wheelock; vice-commodore, John B. Fallon; rear-commodore, Lawrence F. Percival; secretary, Herbert S. Goodwin; treasurer, Fred W. Moore; executive committee, John M. Ward and Frederick A. Flood; membership committee, Percival W. Pope, Joseph W. Knapp, Arthur S. Richardson, William S. B. Stevens; regatta committee, William L. Carleton, G. Edwin Chapin, Fred R. Hiller, George W. Mansfield; member of house committee, Pierce R. Fish. The amendment to the racing rules relating to Class P yachts as adopted by the Eastern Y. C. was passed.

Delaware River Yachtsmen's League

The officers and committees of the Delaware River Yachtsmen's League recently elected are: President, Charles Hieber, Columbia Y. C.; vice-president, George Wilkinson, Trenton Y. C.; secretary, Fred Von Nieda, Farragut S. A.; treasurer, Louis Fredericks, Wissinoming Y. C. President Hieber appointed the following committees: Regatta: Dr. C. S. Street, Columbia Y. C., chairman; Charles Carr, Camden Y. C.; George Oliver, Farragut S. A.; W. Maeht, Wissinoming Y. C. Entertainment: Fred Perkins, Camden Y. C., chairman; Charles Townsend, Columbia Y. C.; Samuel Campbell. Wissinoming Y. C.; James Schneider, Farragut S. A.; John H. Miller, Trenton Y. C. Auditing: William Schroeder, Farragut S. A., chairman; E. B. Crosby, Camden Y. C.; Charles Townsend, Columbia Y. C. Membership: Dr. C. S. Street, Columbia Y. C., chairman; George Oliver, Farragut S. A.; George Kruck, Camden Y. C.; William Frederick, Wissinoming Y. C.; George Wilkinson, Trenton Y. C.

Beverly Y. C.

The officers and committees of the Beverly Y. C. for the present year are: Commodore, Frederick L. Dabney; vice-commodore, J. Lewis Stackpole; secretary, Richard F. Hoyt; treasurer, Walter S. Crane; measurer, Augustus H. Eustis; members of the council at large, R. W. Emmons, 2d, Howard Stockton, Jr.; regatta committee, Robert Winsor, Jr., Dwight P. Robinson, George B. Dabney, Frederick Winsor, J. Lewis Stackpole, Richard F. Hoyt, F. A. Eustis, Jr., J. E. Norton Shaw, Sydney Hosmer; house committee, David Rice, Robert Winsor, Jr., George U. Crocker, William O. Taylor, Edward W. Atkinson; admission committee, A. H. Eustis, Robert Saltonstall, H. Nelson Emmons, Richard F. Hoyt, John Parkinson, Jr.

Winthrop Y. C.

The officers elected in the Winthrop Y. C. are as follows: Commodore, David M. Wisely; vice-commodore, W. J. Downes; secretary, Charles G. Bird; treasurer, Fred E. Bickford; measurer, Reginald S. Wells. Directors: Herbert G. Batchelder, Leopold L. Flood, Charles Townsend. Regatta Committee: W. Milton, chairman, W. E. Traiser, W. E. Roberts, Cyrus Eagles, Howard E. Clarke. Membership Committee: William M. Call, A. S. Urguhart, R. G. Mitchell, F. E. Lamb, C. R. Wright, A. C. Sincare, J. Powers, J. F. Standish, D. H. Bearse.

The following are the percentage of last season's club races, and although racing classes have dwindled down to the 15-foot dory and beachcomber classes, the competition was very keen, and some very pretty racing was witnessed. J. Bergman's Comet won the championship in the 15-foot class and K. G. Batchelder's Glide won the championship in the beachcomber class, W. Y. C. and the combined Point Shirley W. Y. C. beachcomber class.

15-Foot Class.—Comet, J. Bergman, 741.7; Prancer, Burlen & Snow, 640; Vixen, George Griggs, 581.6; Blitzen, R. Gowdy, 456.7; Dancer, R. Wells, 380.

Beachcomber Class.—Glide, H. Batchelder, 766.7; Alice B, F. Belcher, 375; E. M., A. Knox, 183.3; Pedro, J. B. Meisel, 150; Charlotte, J. Doe, 25.

Motor B. C. of Jamaica Bay

The following officers have been elected by the Motor B. C. of Jamaica Bay to serve for the year of 1917: Commodore, Joseph Yenzer; vice-commodore, Charles H. Greene; rear-commodore, Dr. L. C. Heimer; fleet captain, James Connell; fleet surgeon, William Schroeder; treasurer, Louis Benson; financial secretary, James T. Connell; corresponding secretary, John Carlton; recording secretary, James A. Palmer; board of trustees: J. A. Smith, A. Zwilling, Louis Golly.

The club has been incorporated and has an active membership of 46, with a fleet of 31 boats.

Pensacola Y. C.

At the annual meeting of the Pensacola Y. C., January 3d, the following officers were elected: Commodore, R. W. Goodhart; vice-commodore, H. S. Merwin; rear-commodore, Jno. H. Cross; fleet captain, Dan Shepard; fleet lieutenant, F. F. Bingham; secretary-treasurer, W. C. Frederic.

New York Canoe Club

The newly elected officers of the New York Canoe Club are: Commodore, R. Fitz-Gibbon; captain, H. G. Pimm; treasurer, F. A. Jahnke; secretary, Frank Byrne; trustees, L. M. Pultz, G. S. Morrisey; chairman of house committee, W. H. Yelland; chairman of regatta committee, J. F. Godfrey.

Dorchester Y. C.

The annual meeting of the Dorchester Y. C. was held on January 10th and the following officers and committees elected: Commodore, Frank C. Fais; vice-commodore, Walter H. Lord; rear-commodore, John L. Davis; treasurer, D. G. Robinson; secretary, William S. Mace; measurer, Mason S. Chace; directors, Rollin H. Fisher, Michael McGrath, Edward J. Wynde; house committee, George E. Carson, Hubert G. Fisher, George M. Gow, Frank T. Hannon, Walter D. McAvoy; membership committee, Henry G. Allbright, William A. Butler, Hugh D. McAdams, William E. Richards; regatta committee, Archie V. Hayes, William Miller, John T. Moss, John E. Nowland, E. O. Pennell.

Columbia Y. C.

The officers of the Columbia Y. C., South Boston, for 1917, elected at the annual meeting recently are: Commodore, Herman W. Schatzel; vice-commodore, William J. Flynn; rear-commodore, Howard E. Stockbridge; secretary, Theodore H. Campbell; treasurer, George H. Carver; measurer, P. F. Pfund. Theodore H. Campbell was appointed delegate to the Yacht Racing Union and A. Mattson was appointed fleet captain.

South Boston Y. C.

The officers and committees of the South Boston Y. C. for 1917 are: Commodore, Walter B. Lane; vice-commodore, Oscar L. Brombach; rear-commodore, Henry B. Roberts; secretary, William F. Coogan; treasurer, Harry L. Wheater; trustees, James Bertram, Charles E. W. Kent; measurer, Sylvester L. Gookin; fleet surgeon, Dr. Charles L. Rothwell; regatta committee, John Harvey, Arthur M. McGarry, John J. Podolsky, Thomas J. Scannell, Stillman B. Tuckerman; house committee, Chester Clark, Francis H. Corrigan, Herbert B. Donovan, H. Chester Pyne, Roland J. Winterton.

Lynn Y. C.

The members of the Lynn Y. C. are contemplating building a new clubhouse. At the annual meeting in January a special committee was chosen to get plans for a building to cost from $25,000 to $35,000. The newly elected officers of the club are: Commodore, Joseph D. Houghton; vice-commodore, E. J. Stevens; secretary, H. T. Winship; treasurer, George A. Richards; measurer, Eugene Collins.

Quincy Y. C. Power Squadron

The officers of the Quincy Y. C. Power Squadron are: Commander, W. S. Hibbard; lieut.-commander, S. C. Brennan; secretary, C. W. Hall; delegate, W. S. Hibbard; inspectors, C. W. Hall, E. W. Higgins.

Flat Rock M. B. C.

Dr. Eugene Swayne has been elected commodore of the Flat Rock M. B. C. The other officers are: Vice-commodore, A. H. Bradley; rear-commodore, Dr. R. L. Entwisle; treasurer, T. M. Ridler; secretary, Roy W. Richard.

Bayside Y. C.

The annual meeting of the Bayside Y. C. was held on November 11th, and the officers elected were: Commodore, William H. Johns; vice-commodore, William R. Teller; rear-commodore, Mathew Rock; secretary, George W. Hopkins; treasurer, R. J. Hayward; measurer, Joseph E. Hill; members of board of governors to serve three years, James A. Dayton, Edwin C. Sprague.

Orienta Y. C.

The annual meeting of the Orienta Y. C. was held at the clubhouse on January 16th. The ticket prepared by the nominating committee was presented and elected. The officers for the coming year will be: Commodore, Swepson J. Brooks, M. D.; vice-commodore, Adolph Hoerr, M. D.; rear-commodore, A. Vanderlaan; secretary, Joseph Bister; treasurer, J. Lawrence; trustee, 1919, R. P. Brewer; trustee, 1922, A. L. Snow.

Horseshoe Harbor Y. C.

The Horseshoe Harbor Club members have elected these officers for the season of 1917: Commodore, Robert S. Galston; vice-commodore, Dr. J. C. Hasbrouck; secretary, W. H. Shaw, Jr.; treasurer, J. Ross Collins; trustee, J. S. Strauss.

Fire Protection for Power Boats

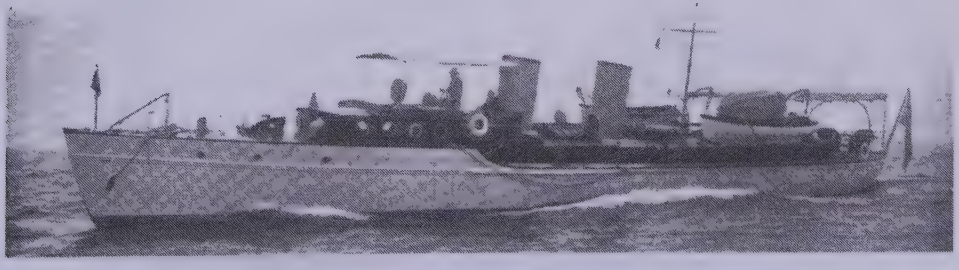
By H. E. Dantzebecher, N. A.

THE question of fire prevention on gasolene-driven boats is one that has always commanded a great deal of attention, and owing to the highly volatile and inflammable nature of this fuel, one which the Government authorities and fire and marine insurance underwriters are scrutinizing more carefully than ever. As long as tanks are tight and properly installed with the right piping and fittings specified and used, from tanks to engine, and care taken to see that no flooding of carbureters or leaks permit an accumulation in the bilge, there is really no danger.

Many fires are caused by the "backfiring" of the engines, and in a four-cycle machine, is always due either to an improperly seated intake valve, or too poor a mixture, more often the latter, but even then, there is no danger unless gas has been allowed to leak into the bilges or collect on the floor around the engine.

The discovery of Pyrene has been a great step forward in helping to prevent the spread of fires of this character and all boats are required to carry such apparatus, although buckets of sand are also specified. Many times fires start so that it is impossible to reach the "gun" or, as is often the case, they are put in some inaccessible place, such as a locker, where it is impossible to get them, and there is nothing to do but let it burn.

Some time ago, the writer originated the idea of placing a tank of sufficient size on deck, filled with Pyrene, under pressure, leading pipes under the deck to galley and engine room, with spraying nozzles so placed that they will spray the room thoroughly, same to be operated from on deck by the simple turning of a valve, or it can be made automatic, as in buildings, but the operation of simply opening a valve would seem to be the best, as it would act more quickly and the fire could not gain such



Navigator, Clarkson Cowl, Owner. Designed by Swasey, Raymond & Page and Built by Murray & Tregurtha. 89 Ft. 6 In. L. O. A., 14 Ft. Breadth, 4 Ft. 6 In. Draught. Two 6-Cyl., 6½-In. x 8-In. Murray & Tregurtha Engines

headway, and in a gasolene fire, this is of supreme importance. There should also be provision made to close off the gasolene supply at the tanks from on deck so that the main source of supply can be cut off.

Tanks and piping, particularly around the engine, where the vibration many times causes leaks, should be gone over carefully, very often, when underway and always inspected and valves turned off at the end of a run. In filling tanks, gasolene should be thoroughly strained and the pipe-line kept free of all water or dirt, as this is a very common cause of backfiring.

The cost of a pressure system is not very great, and the insurance companies would no doubt make a reduction in the rate, so that it would soon pay for itself and it would be a long step forward in eliminating the danger from a fire of this character.



P. A. Proal's Novel Ice-Sled

Pierre A. Proal, member of the Deal and Rumson Country Clubs, and of several yacht clubs, has a power sled, which he is using on the Shrewsbury River, which he expects to be able to beat the fast ice-boats Imp and Drub. Mr. Proal is well known in the yachting world by his power yacht Muirmaid which he has raced for several seasons.

The new sled is built something like an ice-boat in that it has a frame and body similar to the sailing craft, and has oscillating runners which allow for the unevenness of the surface of the ice. The craft is steered by an automobile wheel which operates on the front runner. The mechanical equipment is a two-cylinder, four-cycle aero-thrust engine with cylinders 4 inches by 4 inches, developing 14 h.p. This turns an aeroplane wheel 6 feet in diameter, 1,200 r.p.m.

The runner plank is of white wood, 5 feet 6 inches long, and the backbone is of chestnut and is 9 feet long. The runners are of cast-iron. On the backbone are two regulation auto bucket seats.

Mr. Proal expects his new yacht to make a mile-a-minute and he has already arranged a match with I. T. Straus, of Newark, owner of the fast ice-yacht Imp, which will be sailed by Reuben White. The new sled has been built under the supervision of Edward V. Willis. The aero sled is growing very fast in popularity, and with a 3-h.p. engine a speed of 60 miles can be attained and with a 5-h.p. engine the speed is more than 70 miles. If there is good, clear ice this Winter, the sport with these new sleds will be very popular.



Ice-Sled Owned by Pierre A. Proal, Which Will Race the Fastest Ice-Yachts on the Shrewsbury

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Right of Way

Editor of THE RUDDER:

WILL you please be kind enough to outline for me the navigation rules pertaining to the following controversy and advise which boat was in error?

This incident took place on the Black River at Sputh Haven, Mich., a stream which is about 200 feet wide at the point where the near-collision occurred. Three gasolene-driven boats were involved, which we will call *A*, *B* and *C*, all of which are capable of from 12 to 16 miles per hour. *A* is a hunting cabin cruiser and can do about 8 miles per hour. *B* and *C* entered the harbor from Lake Michigan about 150 feet ahead of *A*. At this time *A* was running about 6½ miles an hour and maintained this speed without any variation. *B* and *C*, running ahead of *A*, changed their speed to some extent, at times running about 50 feet ahead of *A* and at other times increasing this lead to about 150 feet.

About a half mile from the mouth of the river the three boats passed under the swinging bridge which has a long center support, narrowing the channel to one-half its regular width. At this time *B* and *C*, running side by side, were well off the starboard bow of *A*, and from 50 to 75 feet ahead of her. Without warning, *B* turned sharp to port, crossing in front of *A's* bow. The reason for this sudden change being that the young man driving *B* saw a friend on the bridge. By fending off, a collision was avoided. Boat *C* does not enter into the controversy whatever.

Will you please advise me which boat was in error in this case, remembering that at no time did boat *A* contemplate trying to pass the other two boats. No whistles were blown on either boat, but the crew of boat *B* admitted knowing that *A* was following them up the river. *B* docks some distance further up the river than *A*, and the crew of *A* figured that *B* was going up to her boathouse.

FRANK TEMPLETON.

In the above case *A* was in the wrong, for the rules say: * * * "Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's sidelights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

* * * "Every vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

* * * "Notwithstanding anything contained in these rules, every vessel, overtaking any other, shall keep out of the way of the overtaken vessel."

From the foregoing it will be seen that *A*, being the overtaking, should have kept clear, no matter what *B* did, but should it have come before an Admiralty Court, while *A* would have been held responsible for any damage which may have resulted from a collision, it is a question whether they would hold him to it without very strongly censuring *B* for his poor seamanship in suddenly altering his course without any signals, for the rules further state that, "Where by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed. * * * In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger. * * * Nothing in these rules shall exonerate any vessel or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required to the ordinary practice of seamen, or by the special circumstances of the case."

An Old Subscriber Comes Back

Editor of THE RUDDER:

I have been extremely interested in seeing in the December and January issues of THE RUDDER your articles concerning the activities of the Power Craft Association and have found my curiosity aroused as to the amount and general accuracy shown therein. As you can imagine the subject seems to me of more than passing moment, and I want to show my aroused interest in THE RUDDER, due to these articles and to their having led me to note the great improvement in this publication under your direction, by taking up again the subscription which I had allowed to lapse.

JOHN H. BARNARD,
Secy. Power Craft Assn.

Florida Weather and Fishing

Editor of THE RUDDER:

I want to thank you for your courteous letter in response to my criticism of the article "South and West from Miami." All this region is undoubtedly of great and growing interest to yachtsmen, since throughout it wind, water and natural interest offer ideal cruising conditions.

I have just read "A Fisherman's" questions about this country in the January RUDDER and would like to add the following to the information given by the Hydrographic Office:

1. In the parts of Florida Bay named there is no heavy sea at any time, the water being divided by long, narrow banks (awash) into many small "lakes" (locally so-called). Five feet is far too much draught to carry.

A five-foot channel was once opened from Biscayne Bay to Bahia Honda, but four feet is practically the limit, and three or less is much better. Between Cape Sable and Marathon my boat, drawing *two feet*, needs care to take through at times.

2. One can usually anchor out of reach of mosquitoes, but it is very desirable to have complete nets, as it may be more convenient to stop inshore, where they are sometimes very troublesome. Frequently there are none anywhere.

3. If by "fishing season" is meant the sportsmen's season, Spring—it offers the finest weather imaginable. The Easterly trades blow a large part of the time, fresh, clear and dry, with maybe an occasional thunder-squall. In Winter, there is now and then a Norther—two days' cold blow.

4. Many yachts cruise the keys for the fishing, chiefly in April and May. Caesars Creek at the foot of Biscayne Bay and Angelfish five miles South, are favorites for general fishing all Winter and Spring. Barnes Sound and nearby sounds, together with the inlets as far as Bahia Honda, are tarpon grounds—best in May. Indian Key is a famous old reef-fishing headquarters and a good anchorage. Long Key has a comfortable fishermen's "camp" (hotel), and many public and private boats rendezvous there.

There are more fish, better water, and more general interest in the outer line of keys and the reef outside than in the flats inside and the mainland. It is all fascinating, and full of fish.

Pennsylvania. VINCENT GILPIN.

When Kittie Beat Almira

Editor of THE RUDDER:

I was very much interested in an article in your January number about the Hanley cat, Almira. I raced Kittie against Almira many times, and I recall a race at Indian Harbor on Labor Day, 1897, I think, in a vicious Northeast two-reef breeze, Almira, sailed by Addie Hanan, in which I won by over 10 minutes on corrected time, and only about a minute behind on actual time, and Kittie measured 23.6 feet racing length, while Almira was just inside 30 feet racing length.

Kittie was built by T. R. Webber on my ideas, had a narrow lead keel, through which ran a 200-lb Tobin bronze centerboard, no inside ballast. Carried all hollow spars, boom, gaff and mast, had side and forward stays, as a hollow mast must be absolutely rigid. I built Kittie for a light-weather boat, and she was very fast, but, strange to say, was at her best the harder it blew.

She won the first prize in both the catboat races for the Flint Cups, held by the Larchmont Y. C., open to all catboats, and several 30-foot boats competed, notably Almira, Addie Hanan, and Mary, W. E. Ellsworth, two of the best of the 30-foot cats and sailed by two of the best skippers, Hanan and Ellsworth.

In sailing Kittie in the Flint Cup Races, I lost 1½ feet, as Kittie went up to 25 feet racing length, the minimum in the 30-foot Class. This corroborates the change ideas carried out on Almira. I, as a boy, sailed a Cape Cod cat at Nantucket, had a yawl built by Wilton Crosby, Osterville, and had listened to all the old ideas so well expressed in the interesting article in this month's issue of your up-to-date magazine. HAZEN MORSE.

Rigging for Squaresail

Editor of THE RUDDER:

I have been much puzzled to know just how the slings or parral of the squaresail yard of the old-time cutters were confined to the mast and yet allow the gaff of the mainsail to be raised or lowered.

Copies of old-time prints always show the squaresail yard below the jaws of the gaff even when the square topsail is set, and when closehauled the yard is lowered. This is similar to the sketches of the Baltic ketches showing the vessel running with both squaresail and square topsail set. These, I presume, must have the parral of the lower yard arranged in a similar manner.

If it is not presuming too much on your time, will you kindly advise just how this was done, as I cannot think of any way in which this could be done without interfering with the gaff and the hoops of the mainsail, unless the yard was confined to a jackstay on the fore side of the mast.

Also please advise if the book on "Seamanship," by Todd and Wall, relates to old-time seamanship, not steamship handling.

Rhode Island. A. J. FENTON.

E. Keble Chatterton, in "Fore and Aft," page 192, states that a horse, or as you say, a jackstay, was used and the yard fastened to that by means of a traveler so that it could be lowered up and down. In olden times, before the hinged truss was invented, the lower yard was held to the mast by a rope around the mast. Wooden rollers like ordinary beads were strung on this rope, and the yard could be lowered to the rail.

The modern hinged truss is used principally to keep the yard away from the lower rigging, so that the yard can be braced sharper than it could if it was close to the mast.

"Seamanship," by Todd and Wall, is a modern work and mostly on steamship handling. "Fore and Aft" gives the history of that rig and is well illustrated. "Ships and Ways of Other Days," by the same author, is a good book for those interested in old-time vessels. "Sailing Ships and Their Story," same author, is also a good book.

Bell Signals on the Lakes

Editor of THE RUDDER:

In your Question and Answer columns, I see you published code of signals between pilot and engineer. I regret to correct you, but I think it my duty, being a licensed man, and some one has misled you. Inclosed please find copy of same given out by the Steamboat Inspectors.

Milwaukee, Wis. H. K. MARTIN.

* * *

Editor of THE RUDDER:

As mis-information is worse than no information at all, we are calling attention to the mis-statement in your January issue in regard to engine room bells used on the Great Lakes; correctly given, they are as follows:

One bell—stop (either when backing or going ahead).
One bell—go ahead (when stopped).
Two bells—back.
Three bells—check.
Four bells—full speed (ahead or astern, whichever way the engine happens to be working at the time).

Jingle, or three bells and one long one, calls the engineer to stand by or releases him from further duty,' as the case may be.

Port Huron, Mich. NIPIGON TRANSIT CO.

* * *

Editor of THE RUDDER:

In THE RUDDER for January your answer to P. E. Austin regarding the bell and whistle signals in use on the Great Lakes is not quite correct. They should be:

One bell or whistle—stop.
One bell or whistle—ahead.
Two bells or whistles—back.
Three bells or whistles—slow.
Four bells or whistles—full speed.
Four bells or whistles—all right (stand by).

Two bells or whistles *always* mean back whether the engines are stopped or going ahead, though usually when going ahead, one is given to stop and then two to reverse if there is time to give them so.

Spring Lake, Mich. JOHN D. GREEN.

* * *

The above three letters concerning whistle signals in use on the Great Lakes, River St. Lawrence, Lake Champlain and tributaries, have been received in criticism of our reply to P. E. Austin's inquiry in last issue. Mr. Green's letter corresponds to the new regulation of the Steamboat Inspection Service, a copy of which, under date of May 16, 1913, accompanies Mr. Martin's letter.

With regard to the letter of the Nipigon Transit Company, we fail to find any authority for the "jingle, or three bells ahead and one long one," as a signal for release or to stand by. The following are the official regulations:

One whistle or one bell—go ahead.
One whistle or one bell—stop.
Two whistles or two bells—back.
Three whistles or three bells—check.
Four whistles or four bells—strong.
Four whistles or four bells—all right.

The 48-Foot Military Type Express Cruiser Built by the Gas Engine and Bridge Deck; Also t

The Naval Reserve

To all who appreciate the necessity of preparedness, the steps now being taken by the Navy Department are of extreme interest. To many it is known that, under the Naval Appropriation Act approved last August for the fiscal year ending June 30, 1917, there were created various classes of naval reserves, but to carry the law into effect much detail work was essential before actual enrollments could be begun. This has now been accomplished and the results are embodied in a series of pamphlets covering each of the several classes, so that all who would volunteer their services may learn the requirements demanded for each class and the terms attaching to each.

At present the defense of each naval district devolves upon the senior officer on duty therein. In the second district this is the president of the Naval War College, at Newport, R. I., but in most districts it is the commandant of the local Navy Yard. With, however, increased activities in coast defense, the duties involved will be too much for proper handling by one already fully occupied with other matters and selections are now being made of officers to be assigned to this special work. From him applicants will be able to obtain full information on all such matters, but in the meantime the same can be had from the station commandants.

Editor of THE RUDDER:

How much line should one use when anchoring? I have a 40-foot cruiser equipped with a 40-lb stockless anchor and a two-inch line.

New York. T. ALTAMONT.

I hope you have more than that one anchor for your ground tackle. An apprentice in the sport was showing me over his new 60-foot power cruiser. A 40-lb anchor and an 85-lb anchor lay in stocks in the bow. I asked him if he did not carry any heavier anchor, and he said, "Oh, yes, I have a 130-lb anchor for emergency, but it is so awkward to stow that I keep it in the locker at the club when I am not using it." I fear too many yachtsmen equip their boats with a "Dutchman's anchor," safe at home by the fire. To get back on the course again, a good rule is to use three to four times as much line as your depth of water, using more line for a stockless than for an admiralty type anchor. The line should enter the water at an angle of not more than 30 degrees with the surface of the water.

If you give a boat too much line she will yaw badly and weaken the hold, but it is better to err on that side. Always try your anchor after the tide has turned to see that it has not fouled or tripped itself.

* * *

Editor of THE RUDDER:

What is the best way to heave-to in a power cruiser?

Massachusetts. T. L. WATSON.

That is a matter which is governed entirely by the boat itself. The amount of freeboard, and the lateral resistance of the hull, or rather the relative position of the center of lateral resistance and kind of sea running all vary the results. Try different methods until she lays the easiest. Coming across from Sable to Cape Cod in the Eronel, a 45-footer of the same type as the Ailsa Craig, having occasion to stop the engine to clear the feed pipe, we were much surprised to find she lay very comfortably with the wind and sea a point or two on the bow when the helm was put well over. The wind was blowing a moderate gale from the Southwest, and a heavy regular sea, rather short and steep, was running.

Some boats will ride much easier with the engine turning slowly ahead and a litle helm, or some with large helms. Experiment is the only general answer to this problem. If you use a drag and find that she makes bad weather of it with the bow to the sea, cant her and heave her to, stern to the sea. Give her enough line to insure the sea anchor remaining immersed, but too much line will allow her to fall off before she feels the drag.

* * *

Editor of THE RUDDER:

What is a good course for an ocean race for 50-foot power boats—one that could be run in a week-end?

Long Island. COMMITTEE.

Sea Gate to Nantucket Light Vessel and return either inside or outside is an ideal course. It is about 400 miles, making it a forty-hour run for the average boat entirely out of sight of beacons from Fire Island to Nantucket Light Vessel and return, outside. Weather would be fairly constant for the whole course, and at the race season probably no fog.

There is only one thing to guard against. You would be in the track of ocean steamers, but with a competent man in charge and good running lights at night, there would be no danger. In case of thick fog haul to Northward out of track.

Editor of THE RUDDER:

On a recent Block Island Race several boats hugged the shore to avoid the tide, instead of steering a straight course between lights. Which is the better course?

Long Island. A. L. STRONG.

Which boats were ahead when they made each other again? That will answer your question, provided that nothing else entered into the result. Estimate what the gain in speed will be by getting out of the tide and what the increase in distance will be and compare. If about equal, stick to your course. Currents are freakish and in case of thick weather you will be better off.

Suppose that you avoid a two-knot tide by going inshore and run six hours; you save 12 miles, do you not? But if you add 14 miles to the distance by hugging the beach you lose 3 miles in the end. Unless you know the set of currents fully well you are more apt to lose by steering all over the Sound than you would gain by getting out of the tide.

* * *

Editor of THE RUDDER:

I am thinking of studying up a little navigation this Winter. As I expect to try it out myself, what do you advise for a start? I have a good simple text book on navigation.

New Jersey. FRANK SMITHSON.

Master the ground work in mathematics involved and the rest will be easy. Learn how to use logs intelligently, the relations between sides and angles of right triangles, then follow your text. Understand why you use each individual process and it will save stupid mistakes and make your work more interesting.

The Engine Room

Editor of THE RUDDER:

What American body performs the same functions as the English Board of Trade or the French Bureau Veritas?

Rhode Island. H. R. BOYD.

The British Board of Trade and the Bureau Veritas of France in a measure correspond to our United States Steamboat Inspection Service, although the Bureau Veritas, as we understand, has more to do with marine insurance requirements, similar to British Lloyds.

* * *

Editor of THE RUDDER:

How can I repair a galvanized sheet-iron gasolene tank, which began to leak just before I put my boat into Winter quarters?

Maine. B. J. J. RICHMOND.

Throw it away instanter, and if you know of any other boats in which such dangerous tanks are installed advise their owners in no uncertain terms that such boats are floating death traps. Galvanized house boilers make good tanks, but they should never come in contact with oak or any wood which will corrode them. Pine, cedar or any similar resinous wood is suitable. Of course the best tank material is heavy soft or hot-rolled copper.

* * *

Editor of THE RUDDER:

How often should the carbon be burned or scraped out of a marine gas engine?

New Brunswick. P. Q. ROWLSON.

We do not believe it ever should be necessary to burn or scrape carbon from the cylinder walls or pistons of a marine gas engine, except the engine is constructed defectively or grossly mistreated by the operator. If any engine in a boat is found to have accumulated carbon deposits to such an extent that cleaning is necessary, it is not from ordinary causes. The reason for this is that marine engines are rarely ever run, like automobile engines, closely throttled.

* * *

Editor of THE RUDDER:

How can I keep my flywheel from working loose on my crank shaft, to which it is fastened by a key?

New Jersey. R. R. CHACE.

Your flywheel key should fit on all four sides, else it is liable to work loose. If the key-way is not the same width in the flywheel as in the shaft, a two-width key may have to be fitted or the flywheel or crank shaft be re-splined. It should have a slight taper with a substantial head to permit of withdrawal. Be sure it is well oiled before it is driven in finally.

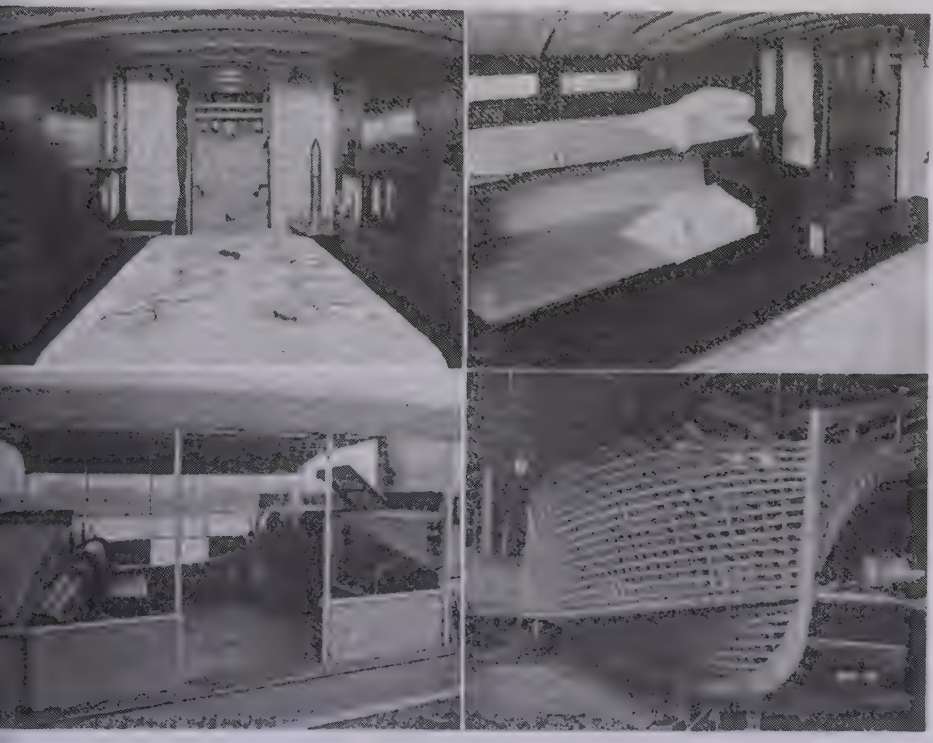
* * *

Editor of THE RUDDER:

Is a two-bearing crank shaft considered good practice for a marine gas engine?

Rhode Island. E. A. BENSON.

This inquiry is somewhat indefinite, as you have neglected to give the number of cylinders. Of course, a single-cylinder engine could not have more than two bearings to the crank shaft while a double-cylinder engine could have either two or three crank-shaft bearings. For marine engines which are driven at their greatest power possible with the propeller used, there is no question that a three-bearing crank shaft is better for a double-cylinder engine and a four-bearing crank shaft for a three-cylinder. Providing the crank shaft is large enough and of proper material, three bearings should be sufficient for a four-cylinder engine. Some six-cylinder engines have three bearings, while others have four. It is plainly evident that a three-bearing crank shaft should be proportioned larger than a four-bearing when [illegible] cylinder [illegible]



46-Foot Military Type Express Cruiser Built by the Great Lakes Boat Building Corporation. Views Showing Interior and Bridge Deck; Also the Boat Under Construction

The Naval Reserve

To all who appreciate the necessity of preparedness, e steps now being taken by the Navy Department are extreme interest. To many it is known that, under the aval Appropriation Act approved last August for the cal year ending June 30, 1917, there were created vari- s classes of naval reserves, but to carry the law into ect much detail work was essential before actual en- llments could be begun. This has now been accom- shed and the results are embodied in a series of pam- lets covering each of the several classes, so that all who uld volunteer their services may learn the requirements manded for each class and the terms attaching to each.

At present the defense of each naval district devolves on the senior officer on duty therein. In the second trict this is the president of the Naval War College, at wport, R. I., but in most districts it is the commandant the local Navy Yard. With, however, increased activi- s in coast defense, the duties involved will be too much proper handling by one already fully occupied with er matters and selections are now being made of icers to be assigned to this special work. From him plicants will be able to obtain full information on all h matters, but in the meantime the same can be had m the station commandants.

In general terms the classes and requirements are as follows:

1st.—The Fleet Naval Reserve.—Requires previous service in the Navy or transfer from other classes.

2d.—The Naval Reserve.—Seafaring men. Entrance limited to those between eighteen and thirty-five.

3d.—The Naval Auxiliary Reserve.—Seafaring men "who shall have been or may be employed on American vessels of the merchant marine of suitable type for use as naval auxiliaries," etc.

4th.—The Naval Coast Defense Reserve.—Those "who may be capable of performing special useful service in the Navy or in connection with the Navy in defense of the coast." Among various other qualifications are included "owners and operators of yachts and motor power boats suitable for naval purposes in the naval defense of the coast."

5th.—The Volunteer Naval Reserve.—Those eligible for any of the foregoing classes who enroll without demanding retainer pay or uniform gratuities in time of peace.

6th—The Naval Reserve Flying Corps.—Among others, "members of the Naval Reserve Force skilled in flying air craft or in their design, building or operation."

For all classes American citizenship is requisite.

THE RUDDER

Published on the Twenty-Fourth of the Month
BY
THE RUDDER PUBLISHING COMPANY
254 West 34th Street, New York, U. S. A.
To whom all communications should be addressed
Down Town Sales Office
9 MURRAY ST., NEW YORK
Arthur F. Aldridge, President
Andrew Paterson, Vice-President and Business Manager
James R. Thomson, Treasurer
Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

The Power-Boat Show

The annual exhibition of power boats, engines and accessories which will open in the Grand Central Palace on Saturday, January 27th, is larger and more representative than any show in the history of the National Association of Engine and Boat Manufacturers. Every available inch of space in the big show building is engaged and the attractions to the yachting public are greater than ever. This is what might be called naval year, and the general trend of the boats is towards the type popularly known as the patrol or scout cruiser, and some most attractive and serviceable vessels have been sent from the builders' yards. These boats somewhat belie their name. They are not designed merely for duty in the event of hostilities, but are in every sense yachts, and those who favor this type will find that they are not only staunch and able sea-craft, as they must be for continuous work at sea, but their arrangements are most complete and comfortable and they can be used just lazying along in smooth waters with a congenial company on board.

The marine engine is improving every year. This engine, unlike the automobile engine, must stand severe tests, and when in service, is driven to its limit more than 90% of the time. That it stands such a severe strain speaks volumes for the products of the engineers and builders. This year the many manufacturers exhibiting at the show report many improvements and refinements of models, and visitors who love an engine will find a great treat in store for them at the show.

In the Quarter-Deck Section of this issue will be found plans of the floor space in the Palace and a directory of the exhibitors. This directory tells just where each exhibitor can be found and what he is showing. THE RUDDER will be found at Space No. 29 on the mezzanine floor. It is on the South side of the building. Visitors will be welcome there at all times and a competent staff of representatives will be ready to receive guests and to give any information they may ask for. A full report of the exhibition will be published in the March number of THE RUDDER. It will be written by men who know.

The Fitting-Out Number

The next issue of THE RUDDER will be the annual fitting-out number. This number will be most attractive in every way. It will contain a beautiful picture supplement of 16 pages, and as its name signifies, will give lots of useful information and hints about fitting-out. This number has always been of particular value to those who wish to dispose of their yachts, and although there is a great demand for yachts of all types, there are hundreds of owners who wish to dispose of their boats for various reasons, often because they wish to own a larger vessel or one of another type. This "yachts for sale list" is very attractive because it is replete with pictures. Those who wish to avail themselves of the opportunity to offer their yachts for sale through this recognized medium should send their copy to THE RUDDER office as early as possible. It takes time to print and publish such an edition as this will be, and delay often means disappointment.

Manhasset Bay Cup

The committee of the Manhasset Bay Challenge Cup has disqualified the yachts Hayseed and Britomart for foul sailing in the last race of the series, but has not sustained the protest against the Ellen. The committee gave long and careful consideration to these protests, and while the disqualifications make no difference in the result of the races, their moral effect should be good. By its decisions the committee has practically decided that some of the yachtsmen made a combination to sail against certain yachts in the race and in favor of another. The conditions of the Manhasset Bay Challenge Cup require individual entries from clubs. Each yacht competing represents some one club, and its owner must sail in the interest of that club alone, endeavoring to win only by fair sailing. It is to be hoped that now that the atmosphere has been cleared future contests for this trophy may develop all the best there is in the sport of yacht racing, and that the races to be sailed this year may blot out all past unpleasantnesses.

Several of the recent editions of THE RUDDER are out of print. Many have tried to procure copies through our office, but THE RUDDER management is sorry to announce that they can only be procured by purchasing a bound volume. The circulation of THE RUDDER is growing with each edition, and while efforts have been made to keep up with this growing demand, they have failed. The demand for the March number, the fitting-out number, will be greater than ever and it will be well to place orders for this number early with the newsdealers or better still, send directly to THE RUDDER office, and subscribe for a year. This costs $2, and the magazine is delivered each month at your home.

To publish all the very complimentary letters that are received by THE RUDDER management would fill too much space each month, and would make reading interesting only to the management. We thank everyone who has written to us whether they have been in words of praise, criticism or giving advice. We are always glad to hear from our readers and can usually find room for anything that is of general interest. Short cruises are always interesting, and if they are accompanied by photographs the interest is increased. The editor will always find time to read such articles.

The Rudder Competitions

The first of the Rudder designing competitions will close on March 1st. This is for a fishing boat suitable for Florida waters, and the three prizes offered amount to $85. In addition to these prizes, every competitor who fails to win a prize will receive THE RUDDER free for one year. The other competitions will close on April 1st. These are for a shoal-draught work boat, interior arrangement of a 30-footer, the best arranged stateroom, and the best arranged galley. Details and conditions of these contests were published in the January number of THE RUDDER. For those who are entering the interior arrangement competitions some suggestions might be obtained from the Cabin Plan Book, which is published by THE RUDDER.

Henry J. Gielow, the well-known designer, Clifford D. Mallory, a yachtsman of experience, and the editor of THE RUDDER will act as judges and pass on the merits of the designs submitted. Mr. Gielow's ability is known wherever a yacht has sailed and Mr. Mallory as a racing and cruising yachtsman, thoroughly familiar with Southern conditions, are well qualified to decide which are the best designs. No two better men could have been selected. Each is keenly interested in the sport and THE RUDDER congratulates themselves on having two such capable men pass on their work.

The supplement this month is the houseboat Lanai, owned by Mrs. Arthur Curtiss James. Lanai is one of those popular types of houseboats built by the Mathis Yacht Building Company at Camden, N. J. She looks more like a roomy power yacht than a houseboat, but in recent years great changes have been made in houseboats. These changes are due to the development of the gasolene engine. This yacht is 70 feet long, 17 feet 4 inches breadth and 2 feet 3 inches draught. She has twin screws and these are driven by two four-cylinder, 6-inch by 7-inch Craig engines.

It takes time to move our legislators, particularly those at Washington, but delays in the proposed amendments to the Naval Act of last year may be serious at this time. It is reported from Washington that the Navy Department has framed the amendments which are to satisfy the suggestions made by the Power Craft Association and others who are interested in the development of a naval reserve and a coast patrol. It might be well to mention that the fitting-out season is rapidly approaching. It takes time to build and equip vessels suitable for patrol duty. Many yachtsmen have announced their intentions of building vessels suitable for defense work as soon as certain changes are made in the present law. Unless these amendments are passed soon it will be too late to build for the coming season, and a whole year will be lost.

Miami Races Postponed

At least five of the power boats entered for the races at Miami, which were scheduled to begin on January 18th, could not be finished in time and so the committee decided to postpone the races until February 15th, 16th and 17th. This postponement necessitated a change in the entire program and the new schedule is Miami to Nassau Race, February 23d and 24th; Miami to Key West Race, March 3d; Miami to Palm Beach Pier Head, March 10th; Key West to Miami, March 17th; and Palm Beach Pier Head, to Miami, March 24th.

Manhasset Cup Protests

The committee of the Manhasset Bay Challenge Cup, James D. Sparkman, Æmelius Jarvis and Stuyvesant Wainwright, has rendered decisions in the protests against the Hayseed, Britomart and Ellen. The findings of the committee are:

"The committee, after considering the evidence presented by the representatives of Nahma in her protest against Ellen in the Manhasset Bay Cup Race for infringement of Rule 12, Section 6, Paragraph B of the Yacht Racing Rules of the Long Island Sound Yacht Racing Association, decides that Ellen was at no time in a position where there was danger of collision with Nahma, nor did she interfere with Nahma's wind. Therefore, the protest is not sustained."

A concluding paragraph states simply that the protests against two other Boston yachts are sustained.



55 x 10-Foot V-Bottom Express Cruiser for Morton F. Plant, Designed by William H. Hand, Jr. Power, Two 8-Cyl. Duesenberg Engines. Guaranteed Speed, 35 Miles

Spokes from the Rudder Wheel

James Craig, who won two legs on the Bermuda Cup with the power yacht Ailsa Craig, has purchased that yacht and will be ready to try and win the prize permanently when another race is arranged.

* * *

North State is the name of a new 85-foot power yacht which F. L. Seeley has had built by Captain F. A. Root, at Daytona, Fla. This yacht, which Mr. Seeley designed, has many new ideas in construction and wonderful accommodations. The power plant is an eight-cylinder Sterling engine.

* * *

Kangaroo, the submarine transport which, after its first trip, was converted into a cargo boat, was sunk recently at Funchal, Madeira Islands, by a submarine. A picture and description of this vessel was printed in THE RUDDER last November.

* * *

Carlos de Zafra, president of the Gravesend Bay Yacht Racing Association, will retire from yachting for a time. He has accepted the position of manager of the Tel-Autograph Corporation at Pittsburgh. Mr. de Zafra was for twelve years connected with the Gas Engine & Power Company. He worked there for shop practice while studying at New York University, and after graduating, was connected with the marine boiler department. Mr. de Zafra was at one time chairman of the Atlantic Y. C. regatta committee, and did much in the interest of the sport on the Lower Bay.

* * *

Logan G. Thomson, of Hamilton, O., is having a 48-foot limousine type runabout built by the Great Lakes Boat Corporation, which is to be driven by an eight-cylinder, 300-400-h.p. Duesenberg engine.

* * *

The Department of Commerce announces the publication of a new edition of chart No. 542, Jamaica Bay, New York. This chart will make a special appeal to yachtsmen who make their headquarters on Jamaica Bay. It is practically a new chart, and shows the changes made in the channels in recent years.

* * *

Arthur H. Marks, who has had the power yacht Aramis built, has sold through Cox & Stevens, the 100-foot, twin-screw power yacht Joyeuse to E. H. Kluge, who is now cruising in Southern waters.

* * *

George P. Granbery will have his Class P sloop Anita changed so that he can race in Class Q.

* * *

William Du Pont, of Wilmington, Del., has placed an order with Swasey, Raymond & Page for a steel steam yacht of the destroyer type. The yacht will be built by Herreshoff.

* * *

The annual dance and dinner of the Harlem Y. C. will be held at the Waldorf-Astoria on Friday evening, February 16th.

George A. Wood, who recently purchased the hydroplane, Miss Detroit, has commissioned C. C. Smith to build another hull in which he will have installed the engines of Miss Detroit.

* * *

W. J. Matheson, who has a Winter home at Cocoanut Grove, Fla., has a 36-foot V-bottom cruiser named Coco, which has been built by the Albany Boat Corporation.

* * *

The Gadfly, a houseboat built by Kyle & Purdy, at City Island, from designs by Gielow & Orr, for Robert K. Cassatt, of Philadelphia, is nearly completed. This yacht is 107 feet 3 inches long, 20 feet 6 inches breadth, and 3 feet 6 inches draught. It is fitted with two Winton engines of 75 h.p. each and will make 12 miles an hour.

* * *

William H. Hand, Jr., of New Bedford, has received orders for several fast yachts. Among these are two for L. Gordon Hammersley and Morton F. Plant. These boats are 55 feet 10 inches long, 10 feet breadth, and will be driven by two eight-cylinder Duesenberg engines. Mr. Hand has guaranteed 35 miles an hour for each boat.

* * *

William M. Chesebrough, of Brooklyn, is having a 55-foot power cruiser built by the Gas Engine & Power Company, at Morris Heights. The accommodations on this boat are very complete and the galley will be 6 feet 6 inches long by 11 feet 6 inches wide and is placed aft. The machinery will be four six-cylinder, 5¾-inch by 7-inch Speedways, which will give a speed of 14 miles an hour.

* * *

Frederic E. Lewis, 2d, of Northport, is having built by the Luders Construction Company, at Stamford, a 145-foot power yacht, which is to be driven by heavy-oil engines. This yacht will displace 300 tons and have a cruising radius of 4,500 miles at 11 knots.

* * *

The Star Class has attracted the members of the Cleveland Y. C., and Commodore H. A. Parsons, and others are to race these popular boats next Summer. Six have been ordered and are being built by Rocky River Dry Dock Company, at Rocky River, Ohio.

* * *

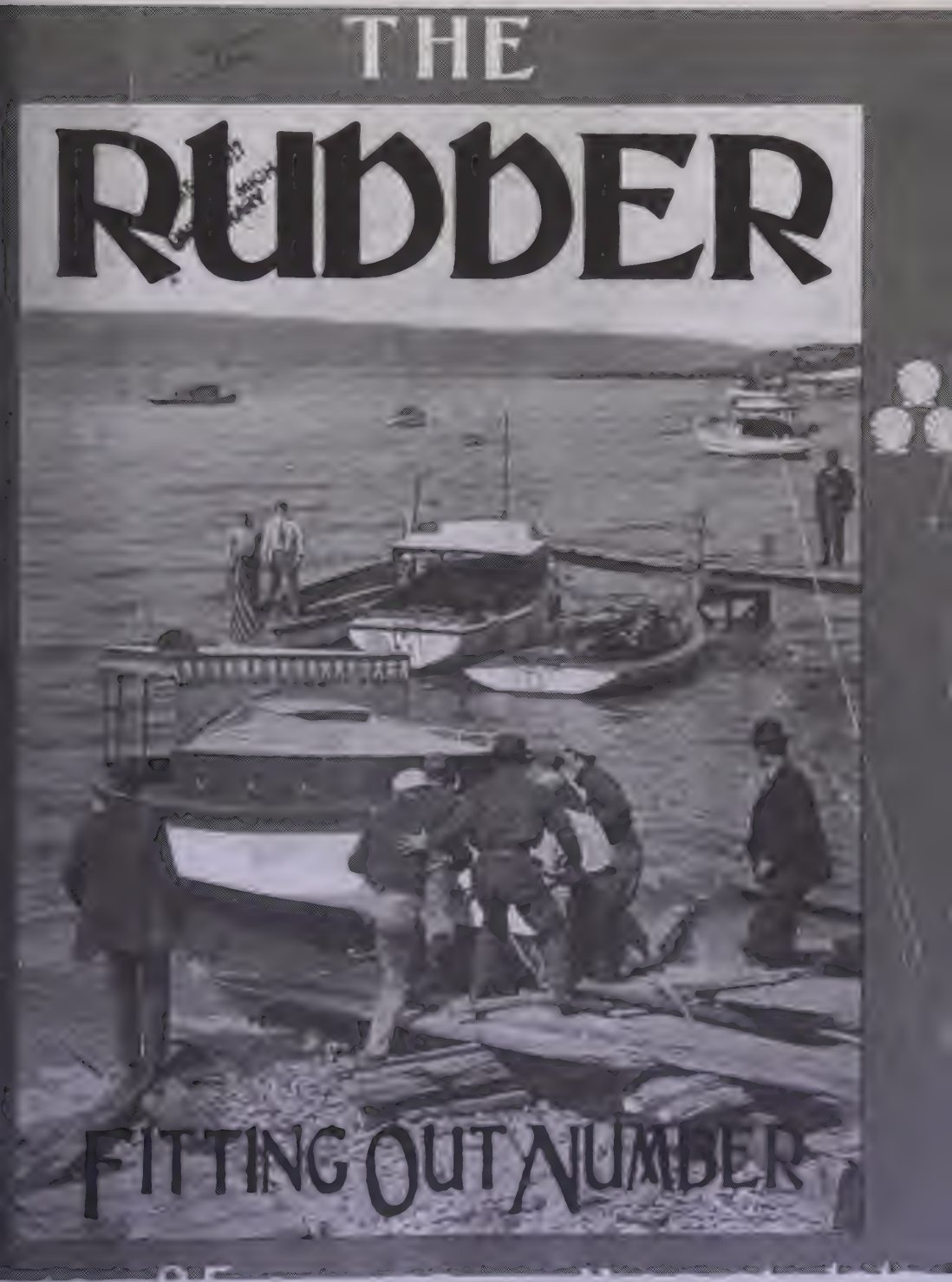
Wallace Brown, of the Crescent A. C., is having a more powerful Sterling engine put in his power yacht Altrurian. Altrurian will make a fast patrol cruiser.

* * *

The death is announced of Captain Robert Duncan at Gourock. He sailed the Thistle when that yacht tried to win the America's Cup, and later when the Thistle was purchased by the German Emperor and became Meteor II, Captain Duncan was again in charge.

* * *

Commodore J. Stuart Blackton, who recently sold the steam yacht Arrow, has purchased the steamer The Limited, designed by H. J. Gielow, and built by the Gas Engine & Power Company and Chas. L. Seabury, Cons., for the late A. C. Bostwick.


THE
RUDDER
FITTING OUT NUMBER



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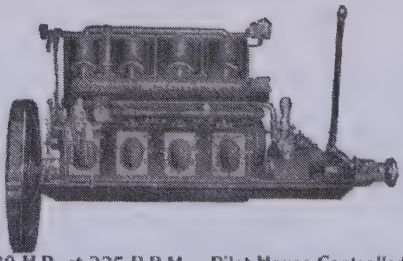
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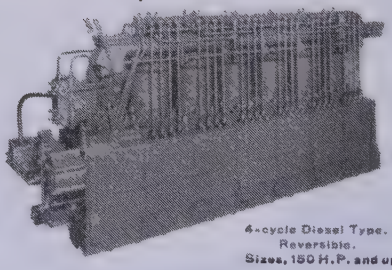
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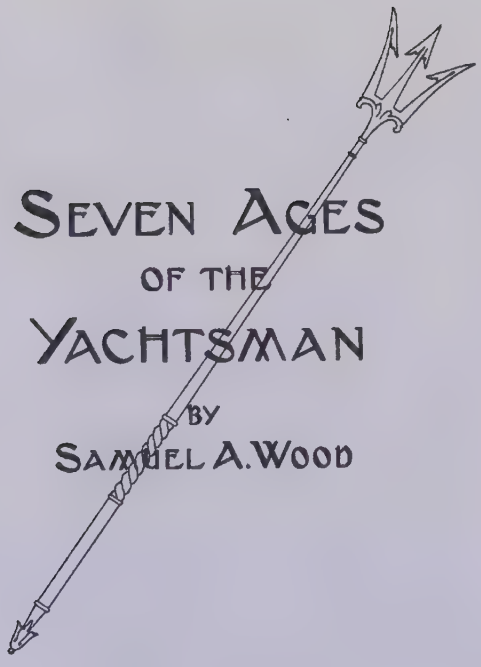
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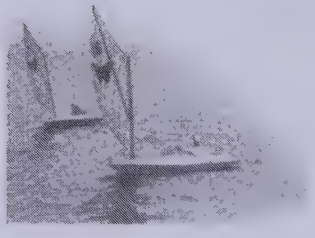
SEVEN AGES
OF THE
YACHTSMAN

BY

SAMUEL A. WOOD

WITH APOLOGIES TO
THE BARD OF AVON.

At first the handy catboat takes his fancy,
And as he sails he sees a vision fine
Of greater ships, built by the necromancy
Of glowing boyish dreams, speed through the brine.



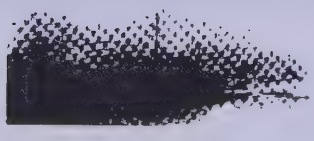






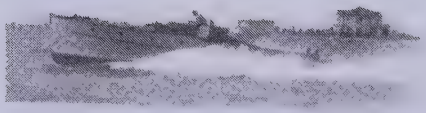
Our dreams are realized by easy stages--
The boy gives up the centreboarding sport,
And, for a season, zealously engages
In powerboating of a modest sort.





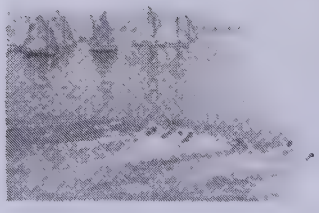

13

But that is much too tame for his ambition,
And he invests in meteoric yacht
Or power ships that scurry like perdition
For cups and glory--and the lord knows what!





THE RACING SLOOP WITH CANVAS VAST DISTENDED
HAS LURED HIM FROM HIS FLEETING LOVE OF STEAM
OR GASOLENE, WHICHEVER HE EXPENDED
TO TAKE HIM THROUGH THE THIRD STAGE OF HIS DREAM.





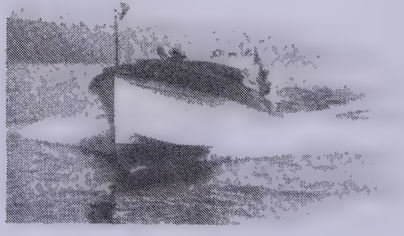
His interest in racing craft he's losing
The ardor of his youth is on the wane--
A handsome schooner yacht invites to cruising
In placid waters of the Spanish Main.





And now in ship palatial he is floating--
He has the joy he pictured would be his
When, as a boy, he loved to go catboating--
Ah! here is boundless luxury--and fizz.







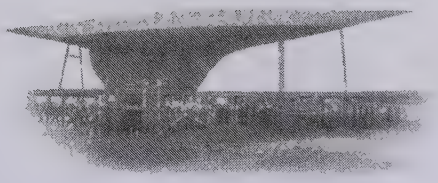


This is his goal. In gentle retrospection
The Admiral of Veranda Fleet of Rest
Finds of all captains in his recollection
The little catboat skipper pleases best.









A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | March, 1917 | No. 3

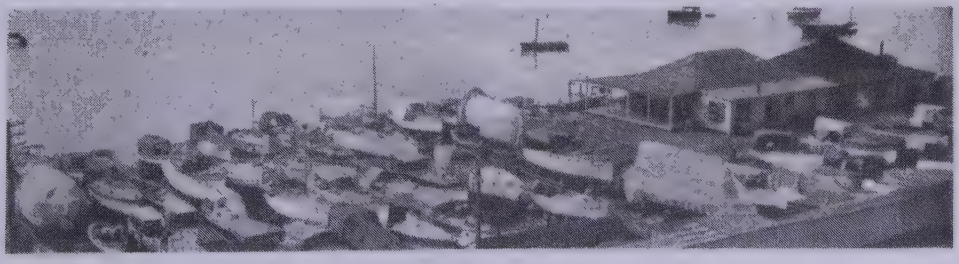
Fitting-Out Time at Hand

THE Winter's storms have nearly all blown themselves away. March has come and its winds will soon be memories. The annual Power-Boat Show, another sign of the times, has come and gone, and now fitting-out time is near. It is at this season of the year that the yachtsman begins to grow restless. The salt in his veins makes him tingle. He longs for the days when he can begin work on his yacht. He wants to have the covers removed, the sides scraped, the engine overhauled, the interior cleaned, and when the warm days come so that he can begin the annual overhaul he will be impatient to get his work done so that he can launch his vessel and once more navigate the waters.

The Winter just now seems unending. Its colds have been piercing, its winds strong and its storms severe, but with a few days of warm sunshine these unpleasantnesses will be gone like the Winter snows, and, with the interest in the work at hand, forgotten.

Thousands of yachts have been laid up during the Winter at club basins, yacht-builders' yards and on the shores of coves all along the coast. They gather mostly near the big cities, and some idea of the popularity of the sport can be had by visiting these yards and basins, where yachts of all types and sizes are packed in as closely as possible. All are covered, some with canvas, others with boards, to protect them from the Winter's storms. The spars of the larger vessels are blackened with weather stains and the sides of those exposed are dingy and dirty too. The hulls little resemble the graceful craft that are to be seen on all waters in the Summer and which give healthy enjoyment to so many. But a few days of honest toil will work a wonderful transformation not only in the yachts but in the owner, who will become healthy and strong with the invigorating exercise.

Just what the coming Summer will bring forth for the yachtsman is uncertain. It may be a Summer of peace and sport; it may be a Summer of war: but peace or war, the time has come for fitting-out or preparedness. Yachting is the only sport that helps towards preparedness. The yachtsman knows the coast thoroughly and is competent to handle a patrol or scout vessel because of his local knowledge. He is useful as a pilot and his help in this way has been recognized by the Navy Department. His yachts too are of immense value for coast defense, and with no National patrol fleet to fall back on, the yachtsmen who last Summer organized and drilled, will turn out loyally for the defense of the coast in case of need.



First Fine Day of the Season Sees the Covers Come Off Very Rapidly

Troubles Caused by Poor Preparation

By Two-Cycle

A GOOD friend of mine lent me a 35-foot cabin cruiser to use on my vacation, as said friend had no less than four power boats and found it quite impossible to use them all at one time, so plans were made for a regular cruise, but as the facts will show, the cruise was short and the experience very long.

The craft in question was designed and built as a racing sloop, afterward being changed to a yawl and lastly, remodeled as a power boat with the jigger rig stepped forward as auxiliary sail. She had been put in commission earlier in the season, that is, painted and put overboard, but the engine had not been turned over since the season previous, so taking the bull by the horns, I endeavored to put the power plant in running order.

The engine, a two-cylinder, 5 by 6-inch Smalley, two-cycle, rated at 20 h.p., turned over easily, and everything looked as simple as a coffee mill, but—before I got that outfit in running order, I almost thought the craft had been "wished on me."

The ignition outfit consisted of a Mea high-tension automobile magneto, the regular equipment and timer having been removed. After obtaining a book of instruction on this mechanism and carefully perusing same, my most earnest endeavor to get any sign of that necessity, the hot little spark, absolutely failed. It therefore became imperative to call in an expert and said expert soon discovered that the magneto had absorbed much salt water which necessitated its removal and baking to drive out the moisture. He took it away to apply the heat cure, and it was duly returned after a three days' wait, but Mr. Expert being busy on another job, it was up to the scribe to put this delicate machine back on the engine base, which job was duly accomplished with the aid of a borrowed set of socket wrenches, the loss of more or less skin and the usual amount of cussing.

Everything now appeared rosy, except "the spark that failed." A second expert was resorted to and the trouble quickly discovered. This type of ignition works on an open circuit and the switch is turned on to break the circuit as this grounds the juice. Having always used the closed circuit type, this was a new one on me.



The Nautilus

Expert No. 2 primed her, kicked over the flywheel and off she went with a few coughs and occasional backfires which were unmuffled. The mooring was cast off and we ran around the bay for a while to adjust the carbureter.

After running about twenty minutes it was found that the craft would not answer her helm. An investigation disclosed the trouble when it was found that the tiller line had jumped out of a sheave and become jammed, breaking several strands. It took some maneuvering with the Sintz reversible propeller and endeavoring to steer with a large Stillson wrench on the rudder head to pick up the mooring, but it was captured at last and Expert No. 2 departed with instructions to take down the carbureter, as it gave evidence of containing an accumulation of dirt.

Repairing that tiller rope is worthy of mention. It was bronze wire rope, and ran around sheaves under the cockpit deck, part of which space was also occupied by the engine and the balance by deck beams, spaced about 12 inches to centers, above which were two long narrow hatches, and it was quite evident that this tiller rope had been installed before the deck was laid. Inaccessibility to the vital parts of a power boat is the thief of time. It took half a day to make the necessary repairs, and some acrobatic stunts were performed that would have been a credit to any circus performer. Ever handle any of this obstreperous wire stuff? When it strands and breaks or the whipping comes off an end it will unlay for a mile, and then some.

Removing the carbureter and draining the two 30-gallon tanks which contained about 5 gallons each consumed another day of my fast slipping vacation, and visions of the Cape Cod Canal and "on to Boston" with the possibilities of the Maine Coast began to fade as rapidly as an unfixed photo exposed to the sunlight. Draining off 10 gallons of gasolene from a small pet-cock under which it was possible to get nothing larger than a pint can is a slow job. There being 8 pints to the gallon, it meant eighty times that pint can had to be filled, dumped, and the gas turned on and shut off.

The gas contained much sediment and nearly enough water to float a skiff. This conglomeration was carefully strained through chamois and the clean gasolene replaced in one of the tanks. Next came the removal of the carbureter, which was inconsiderately placed behind a stout bulkhead, a part of which had to ripped out, and I take my hat off to the mechanic who built it in, for he certainly put it up to stay. At last, however, enough woodwork was removed so that by standing on my head, with toes hooked over the companionway coaming, it was possible to get at the "heart of the engine."

A party on another craft, anchored some 200 yards to leeward, remarked later, that they had heard sulphurous language emanating from the interior of a certain boat, and it is quite evident, had they seen my position, the cause would have been obvious.

The following day visitors arrived, for I had invited a couple of city friends to come and take a sail on my

borrowed "yot." The engine evidently knew that there were cynical critics aboard, for it started right off like any good engine should, and the Skipper, puffing with pride an imperfecto, furnished by one of the guests, headed for the gasolene supply station, for this was to be a real tryout as everything appeared to be in good working order and it was a fine day to show city folks beautiful Long Island Sound.

Engines resemble the ladies, they all have their peculiar moods, especially borrowed ones, for after running about one-thirty-second of a mile she stopped. After going over every detail from continuous cranking to taking George Fitch's advice and yelling hell into the gasolene tank to no avail, my old reliable power dink, the engine of which had been taught to eat out of my hand, was put into action and the unruly cruiser towed back to the mooring. The remarks of those friends were of the (un)kind that are usual under the prevailing circumstances. However, not to be daunted, we explored the bay with the dink.

Expert No. 1 was again called in, and after an examination, he diagnosed the case as "magneto trouble," so he returned the refractory machine to the manufacturers, who retailed the information that the condenser was out of commission. Renewing this part of the delicate mechanism resulted in a wait of four good days and a modest bill of $15. Part of this "watchful waiting" period was devoted to the bilge pump, as the craft had developed quite a considerable leak.

On Sunday, the first day of my second week's vacation, Expert No. 1 returned with the magneto and hooked her up. There was plenty of juice this time, for I felt it in my bones, and when one feels it from one of those high-tension magnetos you know it's there, you are absolutely certain of it, and if anyone is skeptical let him hold one hand on the engine and take hold of a spark plug with the other while the machine is running.

After removing more water and sediment from the strainer, which, by the way, lacked the necessary wire screen, we got her running after a fashion, and although a two-cycle engine, she was four-cycling most of the time, the cause of which stumped Mr. Expert, but she kept a-going, which was encouraging.

The following day I ran over to the gasolene station and put aboard 15 gallons of John D.'s precious fluid, and to my astonishment, she then went off beautifully without a miss, and for that day acted admirably. The next day we went for a longer run, and I was so confident that I left the power dink behind. After running about half an hour, the same old missing commenced again, and more water and sediment was discovered in the gas. After a couple of days of this desultory running I decided to endeavor to get at the root of the evil, so starting at the tank end inspected the feed pipe, one section of which ran uphill, forming a trap. I then began to take down this brass feed pipe, which the man who had installed it had thoughtlessly started at the tank end, well up in the bow, and continued to the engine away aft, with couplings and ells of various degrees, all having right-hand threads and not a union in the line. A heavy timber had been placed across the after end of the forward tank to keep it from shifting, and this had to be removed first in order to get at the piping. This job took about two hours with the supply of tools available. It was some work to disconnect that piping without starting at the engine under the cockpit, which would have necessitated tearing out all the lockers and most of the ceiling on the starboard side. After some maneuvering a section was removed by screwing up one thread which unscrewed the other; of course this is not the most approved method, for when replacing a liberal amount of shellac was necessary to make the joints tight again. A quantity of sediment and water was removed from this section.

On the previous day's run it was noticed that the band on the shaft sleeve which operated the reversing propeller, appeared to bind, so the grease cup thereon was investigated and found to be badly bent, caused by getting in the way of the set-screws in the shaft coupling. Removing the grease cup and changing the angle by adding some odds and ends of pipe fittings, together with hammering out some of the dents, made this part of the apparatus work without the application of a Stillson wrench.

There was a copper pan under the flywheel which was supposed to keep the bilge water from being distributed about the cabin, but this pan leaked, and so did the boat, which made it rather unpleasant while running, as dirty, greasy bilge water was distributed all over the shop like sparks from a giant pinwheel. Some of my guests who came aboard in their shore clothes rather objected to this sort of a shower bath, so more woodwork had to be ripped out to get at the pan and solder the hole. After this had been fixed, it was not necessary to wash down the white enamel paint in the cabin every time the engine had been running.

Sunday, the last day of my vacation, we took a run of about 30 miles, the longest we had attempted with that borrowed craft, and everything ran smoothly.

Pumping twice daily is not so bad when on a vacation, for then we all so enjoy real exercise which tends to increase our appetites and give us muscle, but I figured that this would not be a very pleasant occupation at 6 a. m., and again at night after returning from a day's work in the hot city, so the boat was left at a shipyard for repairs.

Perhaps the novice who reads this article may be led to believe that the gasolene engine is the source of much trouble and annoyance, but this is not usually the case. The engine in this boat worked perfectly when it received clean gas and the spark was right, but the points I have endeavored to bring out are that faulty installation and inaccessibility are responsible for more unsatisfactory operation of engines than everything else combined. Probably no less than 90% of the cases where trouble develops is due to faulty installation or accessories and the balance due largely to the inexperience of operators.

Eight or ten years ago it was not uncommon to see, on a Sunday afternoon, several power boats being towed home with their machinery out of commission, but now that sight is a rare one. It is true that there has been much improvement in engines, and they are now as near fool-proof as it is possible to make any piece of machinery, and the men who operate them are much more familiar with their operation, due to the fact that they have studied the subject and information is so easily obtained.

Don't cuss the engine nor the manufacturer when anything goes wrong, but first examine into the installation and accessories, for the manufacturer is not responsible for a poorly-installed engine, put in by an amateur or some unreliable so-called professional mechanic. The best is the cheapest in the end.

Overhauling the Yacht

By C. G. Davis

IT has been my good luck, being a "boat crank," to have been mixed up in one capacity or another with yachts all my life—to have owned yachts, put my own boat into commission, and run yachtbuilding yards for some years, and am now engaged in that interesting business, forty yachts being hauled out in the yard I now have charge of. I will endeavor to give the man who does his own work on his boats some hints that may help him when he goes to put his yacht into commission this Spring.

One item only too often overlooked is the care that should be given the boat when she is hauled out. At the end of the season yachtsmen grow careless, or business prevents them devoting the necessary time, but at all events the result is generally the same—the boat's bottom accumulates a scum of mud. It is a wet, dirty job to scrub this off, but it should by all means be done, and done while the boat is yet wet, when it can be readily scrubbed off with a broom or scrub brush.

If it is allowed to dry it will crumble and brush off like dust, if the paint under it is in good condition—if not, it hardens into the paint and is well nigh impossible to get off when you want to paint the boat in the Spring—and to paint over it is to waste just so much time and paint. Anyone who has sandpapered off a scum of this kind well remembers the experience—it is the dirtiest job there is. Just watch some fellow when he crawls out from under some boat where he has been sandpapering the bottom and you will readily agree with me, or look at your own face in a looking-glass after doing this work and you will see a face that looks like a "burnt cork coon."

Another important item—it does not appear so to the non-initiated—is to haul the boat out on ground that is not going to become a mud puddle when soft Spring weather sets in.

Another point, while considering storage, many men don't appreciate the advantage of air and sunlight until they try to paint and varnish their boat that has been hoisted up and stored all Winter in a cold, damp boathouse. Then the point comes home to them. Some overcome this objection by having a stove in their boathouse, so they can dry the air therein, but without this, I, for one, would prefer to have my boat hauled out where the warm sunlight and air can absorb the dampness accumulated over Winter.

There is no economy in buying expensive paints and varnishes and then trying to apply them on wood unfit to receive them—you are only wasting time and material.

If the boat has a canvas cover, remove it, but do not throw it off onto the ground carelessly. If not thoroughly dry, spread it out and dry it well before you roll it up, and when you tie it up put a tag on it with the boat's name written on it. Do not, in your impatience, smash the wooden framework over which the canvas cover was spread, but take it down piece by piece, lash them all together and tag them; this may save you or the man you happen to sell the boat to considerable money next Fall when the boat is laid up.

It would be an excellent plan in boats of any size, boats large enough to have a paid captain aboard, if the boat had a log book, where data concerning that boat could be kept. As an illustration, a boat was to be hauled out. Her cover was found badly ripped in places, when it was removed in the Spring, and it was sent away to a sailmaker's to be repaired. There was no hurry about it then, and so that cover stayed at the sailmaker's all Summen. Next Fall, and we'll say a new captain has taken charge of her some time during the Summer, it's "Where is her cover?" No one knows where it was put. She may haul out at another yard where no one knows about the cover being sent away for repairs. If her log book could be referred to, they would know such and such a sailmaker had it and could tell the date it was sent. They would not look in vain about the shipyard or wrongly accuse some previous captain of having sold it for junk. Or the yacht is going into commission and no storage



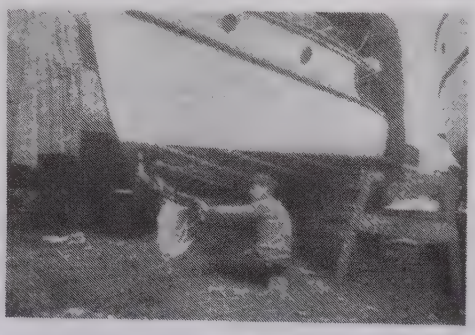
When the Covers Are Off Air Everything Out Thoroughly



When the Paint Gets Too Thick It Is Best to Burn All Off and Start Fresh



After Washing Off the Paint Sandpaper the Seams Before Putting On the New Coat of Paint



Putty Up All the Seams Well—Let It Dry and Sandpaper, Then Apply the Fresh Paint

battery can be found; the new owner doesn't know where it was put; no one remembers. Some say the previous owner took it home, some have an idea some electrical company took it to recharge it, but who? If, in the ship's log book—*which should go with the boat every time she was sold*—the new owner could turn to the date last Fall and see just where the batteries were sent, just who has the compass, the spark coil, the clocks, etc., wouldn't such a simple logbook entry of dates be worth while?

On smaller boats the owner generally comes down in his car and loads cushions, batteries, compass, clocks, coil, etc., into it and takes everything movable home and stores them over Winter in attic or garage. He is his own captain and engineer. He does his own work—paints his boat, overhauls his own engine, and enjoys the work.

The first step in overhauling a boat is to get her dried out, to open her up forward and aft and let the sweet, dry Spring air blow through her and shrink damp and swollen woodwork back so drawers will slide without sticking and doors close without binding. Don't be in too great a hurry to trim off edges until the boat is afloat—for very often doors that will not close when the boat is on land will shut properly when the boat is afloat and worked back into shape after being water-borne a short time.

When thoroughly dried inside, sweep and clean all her bilges under floors and lockers, and give her a good coat of thin red lead paint on the inside of her planking, and frames. If in the Fall when the boat was first hauled out a hose was to be used and the inside well washed and flushed out through the plug holes in her garboards, all the dust and mud could easily have been removed while still wet and this Spring painting of the bilges greatly simplified.

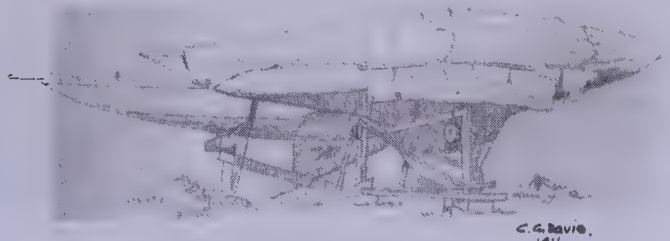
Inside painting and varnishing does not necessarily require a new application each year. Being protected, it can go, as a rule, at least two years, and often longer before more paint and varnish is put on. But the outside of the boat is subjected to much rougher usage, and will need renewing at least every Spring.

First wash off the paint, using some washing powder in the water. The idea being not so much to remove the dirt as it is to remove any grease or oil that may be smeared upon the paint, for new paint will never cover over greasy places satisfactorily.

When clean and dry, take fine sandpaper and go lightly all over the old paint if it only needs refreshing and after dusting off the work, give the hull a new coat. If the old paint is scratched and worn bare in places or has begun to peel, either build up by several applications of paint on the bare spots and then give a final coat over all, or burn it all off and begin anew. When paint begins to peel off it's either due to moisture or grease under the skin of paint forming a blister or the old paint is so thick and hard and has been on so long the adhesive properties of the oil that goes into the pores of the wood and sticks it on have lost their strength—then it's time to burn it all off and begin anew.

Don't put all the paint on at once in one thick coat; that's what most amateurs try to do. Put it on in three thin coats for boat work and it will last twice as long.

Rough seams, all full of broken and dead putty, look like a hopeless task on some boats when Spring comes, but after scraping along each seam with a putty knife





In Painting Always Start from the Top and Work Down



Many Hands Make Light Work. There Are Many Little Jobs That the Better-Half Can Do—the Above Is One

and cracking out the dead putty, it will not be such a hard job as it at first appears to fill them all up flush with new putty.

Some boats are built with seams wide open and the caulking quite thick in between, others are planked so tightly they hardly need any caulking, but that is going into boat building too extensively to enumerate all the various types of seams used in boat building. An open seam is no objection so long as it is what is known as a good caulking seam, that is, the plank edges are farther apart on *the outside* than they are on the inside of the planks. For if they are this way the caulking cotton jams in harder and harder as it is pushed in between the planks and when the boat goes overboard and the wood gets wet and expands, it tightens down on this cotton good and hard, making a tight seam.

A seam known as a hollow seam, that is, more open on the inside of the boat than it is on the outside, is a thing to be shunned. Here the pressure on the outside is pushing the cotton through and as it starts it becomes looser and looser, and a boat so built is always apt to spring aleak.

Whenever you see battens on the inside of a seam of a boat's planking (unless, of course, it be a regular so-called batten seam construction as many light racing hydroplanes or double-planked boats are built), look out for a leak; that is the only way the cotton can be kept in and it's a very poor way, when the seams are defective. In finishing the outside begin at the top and work down if you can, that is, do the cabin and deck work so all the dirt and stain will not run down over the hull's fresh paint. The bottom paint should be the last to put on; you can then cut the water-line clean and true, any surplus paint then runs down on itself, but if you try to paint the topsides last the paint not only will not cover the darker bottom paint, but it will run down and spoil all your attempts to draw a straight, clean-cut line.

It is astonishing to see the resourcefulness and skill of some men in doing tinkering jobs about their boats, where it is a labor of love, while these same men at home could not put up a coat hook for dame wifie. There is nothing that will develop one's ingenuity quicker than to tinker about a boat. A year's training at this and hubby can fix the door bell, repair the extension table, or fix the striking plate on the doors so they will lock.

A man learns plumbing and dozens of other trades so well that, while he may not become eligible to the trade unions, it takes his mind off of his books and business cares, and that alone is as good as a tonic and worth the price of two boats in itself.



Blue Bird, F. D. M. Strachan, Owner. Designed by Gielow & Orr. 126 Ft. O. A., 118 Ft. 9 In. W. L., 18 Ft. 6 In. Breadth, 6 Ft. Draught. Power, Two 6-Cyl. 8½-In. x 10-In. 125-H.P. Speedways. Speed 13 Miles Miles

That Engine of Mine

By Charles A. Starr

MY first marine engine, a tiny one-lunger (installed, by the way, in an 18-foot clinker-built skiff, which leaked something less than a sieve) and which chugged along contentedly for a while and then got as tired as a Southern mule, gave me a liberal education in tinkering and taught me that one little two-cycle single-barreled, put-putter can be more docile and more contrary than any flop-eared beast born South of the Mason-and-Dixon line.

I am no exception to the general rule that men with an engine, like kids, want to see the inside of it at once; like Helen's Babies, they are eager to "shee the wheels go 'wound". But I did restrain myself until the critter went wrong absolutely.

Now I hadn't the first idea of the principle of the gas engine, and what I knew about ignition could be written on your thumbnail, but I had a full supply of nerve aboard, and, after all, when one is adrift on the Hudson with a stalled engine, that is about as useful an article as one could well have. For the life of me, I could never tell how I did it, but, discovering that the plug would spark when out of the cylinder, but did not ignite the gas when screwed in, I fussed about the coil and batteries and wires and connections until I found that the trouble was in the circuit breaker on the timer lever—the little lever used to reverse the small engine without a gear. And, be it known, I reached the home anchorage without being towed.

"With your engine on the blink,
'Tis no time to sit and think."

Strange, isn't is, how men will tackle a refractory engine just as though they had been breaking them in to eat out of one's hand for years. Let something go wrong and the thing has to be taken apart, regardless of the ability to get it together again right, or knowledge of what to do when it is apart. But, when you consider it, there is not so much harm in this trait, after all, if one has a bit of mechanical gumption, or if he knows where to turn for advice about something not comprehended. And I suppose, also, that no matter what the proprieties may be, men will go ahead monkeying with the buzz-saw, and I suspect that is why the editor of THE RUDDER asked me to write something about overhauling the engine.

You fellows who know all about it just turn ahead to the next article, for you will not be interested in what I write—there will be lots of things you can do better; but you, Mr. Beginner, may get a point or two out of this which will help you unravel some of the mysteries of your engine.

I may as well begin by acknowledging my indebtedness for much of the information to H. Clifford Brokaw, principal, and William Schoeller, instructor, of the West Side Y. M. C. A. Motor Boat School, which, so far as I have learned, is the only one of its kind in the country.

It is never too early to start getting the engine ready for the Spring launching. Midwinter evenings are ideal, since one may dissect, adjust, overhaul, clean and reassemble the engine without the rush incident to the warm, bright days, when all is in a fever heat to get in commission, and things are rushed through any old way to get overboard. If one has a large cabin or engine room, an oil heater will make it comfortable to work in, and boards covered with heavy paper laid upon the berths or lockers will make the workbench and the regular lights will be available. If this is not possible, probably your club locker or workroom has facilities. I know some "bugs" who pack the parts of the engine home and make a workshop of the kitchen; generally the Mate helps under such circumstances—at least she can polish brass as good as a man.

There are two things few care to monkey with—the carbureter and magneto—if they have had any experience. They should be cleaned and if they have done good



Clean All Parts Very Carefully Before Putting Together Again



Caliper the Various Moving Parts to Detect Any Uneven Wear



A Good Coat of Enamel Makes It Look Like New

work during the season let them alone; if they need to come apart, better let an expert do it; it generally costs less in the end. Store the magneto in a dry place, free from dust, along with the coil, compass and other delicate parts.

Naturally you will have drained off the gasolene when the boat was hauled out. If you did not at that time, inspect the pipes and valves and strainer, look for leaky joints, for accumulations of dirt in the L's and in the strainer, and see that the main pipe is free. Joints may be made tight with shellac, white lead, soap or graphite. I prefer shellac, for, though gasolene dissolves it, I have never seen a joint leaky from that cause, and it is easy to open up the joint if necessary when it is used. If you have a galvanized tank, see if the bottom is full of sediment; often the coating disintegrates and nothing will clog the supply pipe quicker. Dust and other foreign substances will get in the tank despite careful straining and often make trouble. If the outlet pipe extends an inch up into the tank, it will obviate most of the trouble.

Now to disassemble the engine. First take off all the outer parts, disconnecting the water and gas connections and wiring. Put tags on all parts which indicate where they belong. This is particularly true of the wires, else you will not get them back in the right place without much trouble. When the engine is stripped, unfasten the bolts which hold the cylinder to the crank case and lift off the cylinder. If the cylinder has a removable head, this may first be removed, then the crank bearings be unbolted through the hand-hole in the crank case, and the piston lifted out. If the crank bearings are not worn, it may not be necessary to open up the crank case at all.

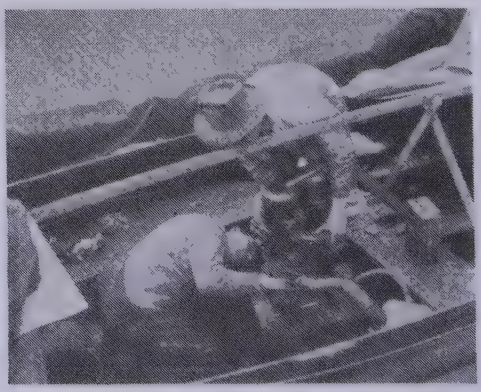
Before handling the pistons, look them over for circles of smudge just below the rings. If you find them, it is an evidence that the rings are passing gas and need attention. The cylinders should be examined for evidences of wear, especially longitudinal scratches. If the compression has been good it is likely there is no fault. Lack of compression may mean that the cylinder is worn oval. This may be determined by calipering it in several places. If worn, the cylinder must be rebored, though very slight wear may be overcome sometimes by grinding in the cylinders, using oversized pistons. Use powdered glass for grinding material, not emery; the latter, in spite of care, becomes imbedded in the steel walls and continues to grind indefinitely. If the wear is of any consequence, better send the cylinders back to the factory to be rebored and fitted with proper size pistons and rings. I have heard some men say that a well-advertised piston ring often will correct troubles which have not gone too far.

Often a piston will be discolored or be coated with carbon and grease on the side next the by-pass, where there is no water-cooling circulation. This is not a sign of a leak, but is caused by the extra heat. The pistons should be cleaned of all deposits, particularly carbon on the head, and the rings should be removed and cleaned. In removing them, make sure that you will be able to put them back exactly where they were, as they are fitted to the grooves. Examine the rings for carbon and scrape it off and scrape the grooves also. You are almost sure to find carbon deposits, sometimes so hard as to seem a part of the metal. The rings should work freely in the grooves. Oil the grooves well before replacing the rings.

To take off and replace the rings use three steel strips of the width and thickness of a hacksaw blade. Old blades with the teeth ground off work well. Slide them under the opening in the ring and work around until the ring is sprung loose from the groove. They will slide off easily. To replace, the operation is reversed.

The wrist pin and bearing are subject to great wear and if there is play here it will produce a knocking and vibration. Usually they have removable bushings or bearings readily replaced, though some are babbitted in the piston rod and in small and cheap engines there is not even babbitt metal in the opening in the rod. The wrist pin should fit snug in the piston. If it does not, get a new one from the factory.

The crank bearings are also subject to great wear. Large engines almost invariably have removable bearings which may be replaced when worn, but many are babbitted in the bronze rod and cap and still others have only the bronze of these parts as wearing surfaces. In the latter types slight wear may be taken up by filing the seat of the lower cap, but this will leave a slightly oval bearing, which should be corrected by scraping the bearing true. Prussian blue in oil or blue chalk rubbed on



Putting the Engine Together Again is not Always Easy But It Means the Job is Nearly Over

the crank will show where to scrape the bearing after one or two revolutions, and a very good job is completed by revolving the crank with the bearing tightened; the wear will show places that need touching up with the scraper tool. I am perfectly aware that hundreds do not scrape bearings after filing the lower cap, but let the engine do the work, tightening up the bearing every trip, so that it finally will wear into a true circle by friction, but this is slovenly and does not make for long life of the engine.

Removable bearings and some others are put in with shims as a rule, by which the wear may be taken up from time to time. This necessitates a little scraping, also, as do new bearings. Where there is much scraping to do the oil grooves should be deepened first.

The crank pins and main shaft journals, if the lubrication has been proper and grit has not been allowed to work in, should be smooth. If they have no grooves it's an indication of excessive wear. Any serious wear must be remedied, and usually this means to have the shaft turned and new bearings fitted. The main and crank bearings should work a little stiff when readjusted, but not enough to act as a brake; the stiffness will not be noticeable when the engine has run a few times.

Very often in going over a two-cycle multiple-cylinder engine, the novice will try the end bearings and finding no play will consider the main bearings all right, while the bearings between the cylinders may be badly worn, so that gas sucks back and forth at every revolution. As crank case compression is necessary that gas may be fed to the cylinders properly, it follows that loose center bearings will interfere seriously with proper operation.

Where the main bearings are of the removable type any wear is fixed easily by taking out shims, or by having the bearings rebabbitted at factory or some machine shop, or by placing in new bearings. If the bearing is a part of the crank case, I would not advise an amateur to try to rebabbitt it, for it is a tedious task, requiring some skill and more patience, usually too much of both for a novice.

On the four-cycle engine the valves must be inspected to see if they are worn and if so they must be ground into the valve seat or new ones procured. The valve stem guides must be tight, also. They have a tendency to collect dust and to wear excessively and must be kept clean unless encased, which is rare on a marine engine. If they are loose they will suck in air and affect the mixture. The cams and push-rods usually require only cleaning, but the push-rod bushings must not be too loose or there will be a rattle and the rods will not push straight, affecting the valve action.



New Gaskets Are Sometimes Required



See That All Equipment is Put Back Securely and Use the Same Bolts, Screws, etc., as You Took Out

All the priming cups, pet-cocks, release cocks and minor valves must be looked over to see if they are tight. Little leaks because parts are not firmly screwed into cylinder or casing, or because the valve is loose, diminish the compression, and hence the power of the engine, or allow gas or oil to drip. These little things escape attention often and become more serious than a fault which makes itself seen quickly. The check valve in a two-cycle, two-port engine, for instance, must have the valve seated perfectly to make a good mixture. A great temptation for a novice is to stiffen the spring. It always looks as though it had been flattened, I suppose, and the tendency is to pull it out. Don't. You will find it hard to throttle down if you do, for at slow speed it will fail to work, and this will stop the engine.

If the enamel is blistered or chipped off the cylinders they should be scraped, or the old enamel removed with one of the good removers and a perfectly clean surface secured. A speck of oil will produce a blister. After the enamel is off, clean with gasolene and if necessary scrub the surface with lye or strong soapsuds. The manufacturers first coat the surface with an iron filler, and over this put two or more coats of enamel, and bake it. The novice will get good results applying the enamel direct to the iron surface and better if he will use the filler first. Care should be taken to see that the enamel flows freely; if too much is applied it will run and make a botchy job.

Rust, of course, must be removed wherever found, particularly on the gasketed connections; kerosene usually will take it off, with a bit of emery if needed, but do not rub a connection enough to make a depression the gasket will not fill, or there will be a leak. Follow the lead of the maker as to gaskets. If he has used metal and asbestos gaskets and they cannot be used over, get a new set of the same kind. Where he has used graphite sheet packing for the water connections and elsewhere, use the same, and where simply a sheet of paper was used, that is the best material for the type of engine. Sometimes it is more satisfactory to buy a complete set of gaskets from the manufacturer, but they may be cut by the greenest novice if he will lay a sheet of the material over the con-

nection and with a ball peen hammer tap out the outline of the outer edge and of every opening, including the bolt holes; then with a knife the gasket may be completed. Care must be taken that no opening is closed or obstructed by the gasket. No gasket with rubber or composition with rubber in its makeup should be used, for it will not stand heat.

When the gasket is ready, coat it thickly with shellac, also the clean surfaces of the connection and let them dry. When ready to put the parts together permanently coat again with shellac, put them in place and bolt the connection quite tight, leaving half a turn or so to be made after the shellac has partly set. Also turn up the bolts after the engine is warm from running. Marine mechanics generally use shellac, claiming it makes a better connection, and in small engines, where making a gasket is a trifling matter, it is all right, but for the larger engine, Mr. Schoeller suggests, particularly for heat connections, taking a sheet of asbestos and soaking it in raw linseed oil; into one side of this rub dry white lead, working it in thickly, and then into the other side dry flake graphite. The white lead will make the gasket hold to one side of the connection, but the graphite will keep the other side free, an advantage when it is necessary to open the connection frequently, as the gasket can be used over and over, while one put on with shellac will break, necessitating a new one. Of course, the metal and asbestos and the sheet graphite gaskets do not need shellac, though you will find some persons use it.

Polish brass parts before replacing, for the polish sometimes cuts the enamel. Whiting will preserve the polish until the engine is started. In replacing the pump, see that the plunger works freely after new packing is put in; a leaky pump keeps things mussy and induces rust. The valves must be free of deposit and should seat properly, or be reground, or replaced. The connections must be tight if the water circulation is to be right. See that the hose between intake and pump has no holes and is clamped fast at each end; also that the inner skin has not buckled over the pipe opening, closing it partly or wholly. If there is a hose for the exhaust water see that it is tight or its drip will be a constant annoyance.

It is wise not to use a monkey wrench in putting in the bolts when reassembling the engine. The wrench will spring and mar the head of the bolt, and generally sets it too tight. Use a cap screw wrench of the right size, which gives the proper leverage and allows tightening without stripping threads. Better get a set than to use Stillson or monkey wrenches.

As to the reverse gear, it is wise to get the instruction book of the maker and follow it explicitly. In general, cleanliness and proper lubrication are requisites. Clean at least once a year and watch for wear of cogs and friction plates, the most likely places, and which may mar the operation of the gear.

When all has been put back where it belongs, that is, the engine is reassembled, a final coat of enamel will finish the job and make the engine look as though it had just come from the factory, while if your work on the parts has been thorough and workmanlike, the engine will give as good service as if new. Some men think a seasoned engine which has had good care preferable to one fresh from the factory and which has to be broken in. You will find that you will become attached to an engine which you have worked over, and which has pulled you through some tight places, and will hate to part with it, even though it is for a larger boat and engine, and it is true with engines as with men, old and true friends part regretfully.

I have said nothing about the ignition features, but it is because a later article is planned to cover this phase, and while you are having a fine time getting acquainted with your engine and learning why it is not necessary to be continually fussing with it, I will be going over the dope on ignition and working out of my own experience some things to help you set and keep your house electrical in order.



Marie, Geo. M. Pynchon, Owner. Designed and Built by the Gas Engine & Power Company and Chas. L. Seabury, Cons. 70 Ft. 3 In. O. A., 65 Ft. W. L., 11 Ft. 6 In. Breadth, 3 Ft. 6 In. Draught. Power, Two 6-Cyl. 6-In. x 6-In. Speedway Engines

Small-Boat Lighting

By R. M. Haddock

IN the lighting of small cabin cruisers consideration of safety, first cost of plant and of installation, upkeep and efficiency, together with necessary care in operation, are the essentials to be decided on according to individual needs.

The question of the safe operation of any lighting system in a gasolene-driven cabin boat depends entirely on the absolute freedom from leakage of the tanks, piping and carbureters. All joints in the feed pipe should be readily accessible for frequent inspection to see that no leaks have developed, brass and copper pipes being the only kinds allowable for this service, and where threaded joints are used they should be made up in thick brown shellac, the threads being cut with a sharp die that has not been used on iron pipe, so that the corners of the threads shall be sharp and fit snugly into the threads of the fitting.

In any open flame system of lighting, which includes kerosene lamps, all kerosene and gasolene mantle lamps working under pressure, and liquid fuel and coal stoves, the danger is not so much from the open flame of the lamps or stove as from the matches used in lighting them. Gas from a gasolene leak is heavy and usually lies near the floor or in the bilge, and a lighted match carelessly thrown down or dropped is the greatest source of danger, and even with careful usage a match will crumble and drop while burning.

Therefore, as far as possible, all openings into the bilge should be avoided, and cracks should be sufficiently tight to prevent small lighted particles from finding their way beneath the flooring. Lamps and gas jets should be placed well up towards the roof, and stoves should be as high above the floor as can be conveniently used.

Of the different types of lighting plants the electrical seems by far the most popular for small-boat lighting, due to its ease of installation, great variety in size and cost, freedom from danger of gas ignition, and general handiness in everyday use. Acetylene gas stored in cylinders and replenished from time to time is also used quite extensively, but up to recently, mainly in the larger boats. At present it is obtainable in small sizes of cylinders similar to those in use on automobiles, and one or two renewals a season will furnish ample light for a 40-footer. This system requires the least attention of any, as after the first installation a replacement of the empty cylinder is all that is required to keep the plant in operation. In the installation of a gas system ¼-inch iron piping should be used, and care exercised in the jointing as in the gasolene fuel feed. Once installed, the attention when in operation is practically nil.

The electrical system being most generally in use, and many owners installing their own plants, a more detailed description will be given. The smallest and simplest practical outfit consists of a 6-volt 60-ampere-hour (a.h.) storage battery with a capacity for five 8-candlepower (8-c.p.) lamps, wired directly to lamp circuit. As no generator is used, the battery must be taken ashore from time to time for recharging. As the battery will carry this lamp load for eight hours with one charge, and in a 25 or 30-foot boat all the lamps would not be called into use at once, except on infrequent occasions, three or four nights' lighting should be obtained, sufficient at any rate for week-end trips.

The next and a most desirable step is to install a generator with the above outfit, by which means the battery can be charged when boat is underway, thus furnishing lights for extended cruising and dispensing with having to take battery ashore to charge. In connecting up the lighting circuit, one charge, and one discharge switch, two fuses, and of course the necessary lamps, sockets and wire are all that will be absolutely required, but here again it is very advisable to install an amperemeter, commonly called ammeter, in the circuit. This instrument shows the rate of charging, thus showing what the generator is doing, as well as the rate of discharge when the lamps are burning.

A further addition of a switchboard on which the switches, fuses, ammeter, and a socket for a trouble light with 10 or 12 feet of cord can be installed, will complete the outfit.

While this is known as a five-light outfit more than five lamps can be installed, so that it is possible to have a lamp for use in special places requiring more direct lighting for short intervals. Also four 8-c.p., 6-volt, and one 12-c.p., 6-volt lamps, the latter for use in a searchlight, can be used, this load to be carried for eight hours. The running lights can also be supplied with current from this source, and are generally wired so as to be controlled by a single switch mounted on the board. Also lighting for the binnacle and current for sparking the engine can be taken from the battery, and is in line with the best modern practice.

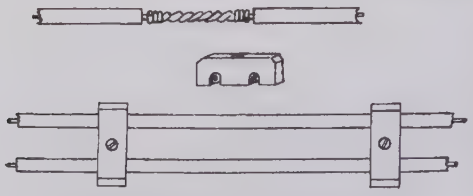
For lighting the compass a ½-c.p. lamp screened with ground glass is ample as only a faint illumination is desired so as not to be blinding to the helmsman. The wires leading into the binnacle and in the vicinity of the compass must be twisted, or the current will cause great deviation to the card and render the compass useless while light is on.

One-c.p. lamps will suffice for the running lights as great volume of light is not needed. Mazda tungsten lamps are best adapted for service in boat lighting, as they are most durable and economical in current consumption, with one-half to one-third that of carbon filament lamps, which should be discarded.

A generator of the permanent magnet type is suitable for small plants and has the advantage of requiring less power to operate and has no field coils to heat or burn out. This type of generator must not be mistaken or confused with the ordinary magneto commonly in use for sparking the engine, and with which it is almost identical in appearance, as it has permanently magnetized field magnets as has the magneto.

The current from a magneto is alternating and cannot be used for charging the battery, which must have a direct current.

For boats 35 to 50 feet a ten-light outfit with a 6-volt, 100-a.h. storage battery, a switchboard on which are



Method of Splicing Wires and Clip for Fastening

mounted switches, fuses, ammeter and socket for trouble lamp, and having a generator either of the permanent magnet or dynamo type, will be found sufficient in most cases. As before, an excess number of lamps may be installed and a searchlight and running lights wired into the system, and current for sparking engine can be taken from the battery. On a full charge the normal lamp load can be carried for eight hours continuously, and for a longer time where there is intermittent use.

For boats 50 to 75 feet a twenty-light outfit, having two (2) 6-volt, 120-a.h. storage batteries, a dynamo type (wound field) generator, a switchboard on which is mounted an ammeter, a voltmeter, an automatic underload cut-out, two lighting and one charging switches, both lighting and charging circuits being fused, and with sockets for running lights and trouble lamp connections, will efficiently light the larger size given above, which is really beyond the scope of this article. For these larger boats, there are many fine outfits on the market of higher voltage, larger amperage and with elaborate switchboards and generating sets driven with independent engines, direct connected or belt or silent chain driven, and at a variety of prices to meet any and all conditions.

In the outfits mentioned the generator has been driven from the main engine, the charging being done when the boat was underway. This will furnish plenty of current where the boat is used for a considerable period every two or three days as in the general run of cruising. But where the owner lives aboard, using the boat only on week-end trips, an independent engine of small power is desirable to run the generator, so that the battery may be kept charged up properly at all times, and will be found to make for economy as well, it being rather expensive to run a main engine of from 20 to 60 h.p. three or four hours twice a week simply to charge a battery that a ¾ to 2-h.p. engine is fully capable of charging.

Searchlights of good efficiency can be operated from any of the above outfits, and for the smaller boats a well-made and very practical searchlight can be installed to operate on six of the ordinary dry cells. Such a light will throw a brilliant white light for a distance of 800 feet and can be regulated to throw either a narrow or wide beam at will.

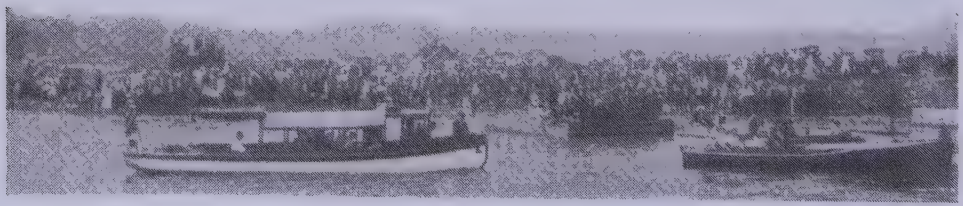
Such a light is very useful in narrow channels where there are buoys to be picked up, and the fouling of which would result in considerable damage and danger to a small boat. In open boats such as runabouts and high-speed launches where there is an electric starter installed, current for the running lights, a light on the dash and trouble light for the engine can be taken from the starting battery as in automobile practice, but for the cabin cruiser the separate lighting plant system as outlined above is the only practical one.

A storage battery, like any other piece of machinery, must have a reasonable amount of care and attention to insure smooth operation and best results. The battery should be installed in a dry, protected place easy of access for taking frequent hydrometer tests, and keeping the level of the electrolyte at the proper height over the plates, all of which information is given in the direction book furnished by the manufacturer, and which should be carefully followed to get the best service and wear from the battery. Only pure distilled water that has been stored only in clean glass receptacles should be used to replenish loss from evaporation or other causes. Distilled water known as "Lilly Water" should never be used. Agateware being a coating over metal and always full of fine cracks which allow the water to be permeated should not be used for holding the distilled water.

In these low-voltage outfits, copper wire of large sectional area, giving low resistance to the current, should be used on all the circuits, for which use the heavy braided cable wires are most suitable. The use of proper sized wire is easily seen in the brilliancy of the lamps and the power needed to run the generator. Wiring should not be run under the flooring where exposed to splashing of an oily bilge, as the oil quickly destroys the insulation. Where possible the wires should be kept separated to avoid danger of short circuiting should insulation be broken through, from which a disastrous fire might ensue.

All holes in bulkheads where wires pass through should be of sizes to allow of easy passage of the wire, the edges should be smoothed and it is good practice to armor the wire with a piece of tape to prevent chafing of the insulation and to place a fastening close up to the hole if there is much vibration likely at the point. Never run a wire between the flooring or a boat's siding and a bulkhead, as it will soon chafe from vibration. Porcelain, fibre or wooden clips are preferable for securing wiring to bulkheads, etc., to staple tacks as commonly used. The latter being liable to cut the insulation by being driven too tightly, and through rust. Also it is difficult to remove the tack without injury to the insulation.

All joints and branches in the circuit should be carefully made and soldered, then carefully wound with insulating tape. All connections should be kept as bright and clean as possible and free from corrosion, or there is danger of burning out the lamp filaments through the high resistance due to faulty connections.



Cruise of a 32-Foot Yawl Around Cape Cod

By F. S. Lovis

ALTHOUGH the run from Newport to Marblehead has been made many times without incident by the amateur navigator, the owner of a small craft does not anticipate the cruise without a certain thrill of interest and excitement of the attending possibilities. The miles of surf-wasted sands of Cape Cod lend no port for the storm-overtaken sailor, and many the staunch ship, caught in a Northeaster, has been thankful to double the Cape and gain shelter within the protecting arms of Provincetown Harbor.

It was in these waters the New York Y. C., a few years ago, met with some exciting experiences, and the run around the Cape has not been listed on the Club Cruise itinerary since.

It was early in June, on a Friday afternoon, we left Warren, R. I., at the head of Narragansett Bay. Our little craft of 26 feet on the water, and with a comfortable breadth of 12 feet, together with a little gasolene kicker, stowed away under the cockpit floor, was named the Blue Water. Why the owner, whom we will call the "Skipper," should have labeled his craft with such a handle, has never been explained.

Our "ship's company," besides the Skipper, were Montie, Thompson and Mitchell, all enthusiastic Corinthians, and excepting Mitchell, having but a week's end away from our terra-firma environments in Boston. Our ambition was to complete the cruise between Friday night and the following Monday morning.

Friday, 4:35 p. m., off Rum Stick gas buoy, a few miles from the start and at the mouth of the Warren River, we attempted to get something of the boat's compass deviations, by the bearings of Conimicut Light some miles away. The Skipper would not vouch as to the quality of our deductions, but ventured the statement that, on a course from Highland Light, he might make a landfall somewhere between Boston and Gloucester.

Dark and low on the skyline, to the Eastward, grey fog banks were gathering, and in the West, the sun yet far from setting, had hid himself behind a beauty of storm-foreboding clouds. As we ran down the bay on the first leg of our cruise, a heavy, most uncomfortable wetness, fresh from the fog factories of Nantucket, came bowling in, thicker and thicker, and the prospect of an all-night sail was not impressing some of our crew with enthusiasm.

At 6:45 p. m., off Gull Lights, our Skipper called up the hatch: "Better make Newport for the night; barometer is dropping and it looks like an Easterly." No one objected. The fog had now come in very thick, and it was with difficulty we felt our way into the inner harbor. The Fall River Line steamer came in later, nearly an hour behind schedule.

Mitchell prepared supper for four. The steak, baked potatoes and hot coffee were quickly stowed and all turned in for the night, hoping for an early start.

Saturday morning dawned dark and cold, with a howling Northeaster, accompanied by a driving rain. There was nothing to do but lay close at anchor in the Northeast corner of Newport Harbor, near the yacht club.

After a hot breakfast, all donned oilskins and went ashore. To one who has never visited Newport and taken the 12-mile drive by the summer residences of America's ultra rich, it will be a revelation. He should hire one of the many phaetons to be had near the Perry Monument.

We took the Cliff Walk of several miles, on the ocean side, passing the Vanderbilt's estate, "The Breakers," the Marble Palace, Senator Lippitt's Castle, and many others of note. The lawns, hedges and grounds were in the freshness of early June, and in as perfect condition as Nature and man can shape.

Saturday night, and still in Newport, but with hopes of brighter conditions for the morrow, all turned in early. Sunday opened with clear skies and a high wind from the Northeast. Our Skipper figured he could haul close on the wind and pick up Sow and Pigs Light Vessel, 18 miles E.S.E. of Brentons Reef. Shortly after nine o'clock, under jib and jigger only, wind aft, we left the inner harbor, passing Fort Adams, through the Narrows and to Brentons Reef in quick time.

Here, sails were trimmed close, engine started and we were off on our course for the lightship. Even under this shortened sail, the yawl heeled well over. We made excellent weather of it to off Sakonnet Point, where a lumpy, cross sea, caused by the incoming tide, tossed us some. At this time, our cookstove, a Shipmate, had become free and taken possession of the galley. It was apparent that if we were to hold our course, we must have more power. The mainsail, three-reefed, was gotten on and easing her off a little, we were soon dashing and tearing through the seas at a pace exhilarating and exciting in the extreme. Our little taffrail log was buzzing like a pinwheel, and the hour, twelve to one o'clock, registered 8.9 miles. At two o'clock the log registered 7.9 miles for the hour, and we were close up on Gay Head. It was with some relief that we ran under the lee of Gay Head into comparatively smooth waters. As the wind was ahead, with an adverse current, we decided to anchor here and await the flood tide, before attempting to beat up the Sound.

Leaving Mitchell to cook dinner, the three of us launched our skiff and landed through the surf on Squipnocket Beach. Gay Head's peculiar formation of a red and yellow clay attracted Montie's attention and a specimen in a 5-lb lump had to be taken along. Thompson had brought ashore the Sunday papers, purchased at Newport, and wished to present them to the Light Keeper. This individual proved to be very agreeable and courteous, excepting he requested us to wipe our feet before entering his perfectly kept tower. Gay Head is one of the few lights of the first order; in the class with Cape Cod and Thatchers. Our visit was both instructive and interesting.

Returning to the yawl, we found dinner. Six o'clock came around in surprisingly short order, with a favorable tide for the run up the Sound. Sail was gotten on, reefed, as when lowered, and soon the shores of Gay Head were but a memory. After passing Devil's Bridge, a cluster of rocks off the end of Gay Head, and the site

of the loss of steamer City of Columbus years ago, we hauled close and headed across for Nashawena Island. With the fading day, the wind, which had held its strength for the past three days, steadily dropped and soon all reefs were shaken out.

We held close to the Elizabethan Islands for smooth water, and a number of short tacks brought us by Quicks Hole, Pasque and Naushon Islands and Tarpaulin Cove.

A beautiful evening, a bright moon and a good sailing breeze; the conditions were perfect for a night's run. It was with regret that the yawl was swung on the last tack and headed for Oak Bluffs (Cottage City), that Montie and Thompson could take the morning boat home.

The bright night made the entrance between the jetties and the picking up of a mooring a very easy matter. We were told that the Government has placed these white barrels in Lake Anthony for the mooring of small craft, as the bottom is too soft for safe anchorage.

In this little landlocked harbor a comfortable sleep was enjoyed by all. Early, Mitchell was astir, preparing breakfast, that our shipmates of the past few days might take the steamer to Woods Hole and the train to Boston. The wind still held moderately from the East, but the Skipper and Mitchell decided to stand by the ship another day, hoping for a fair wind to run over the Shoals. As Nantucket lies to the Southeast of Cottage City, it was figured that this harbor could be made in one reach. Shortly after eight o'clock we got underway. Passing the light vessel off Hedge Fence, we held an E.S.E. course for Cross Rip Vessel, which was passed at 10:30. A fully-rigged four-masted schooner aground on Horseshoe Shoals attracted our attention. This was the Potter, which has since proved to be a total loss, although scarcely 300 yards off her course. Such disasters bring home to us the responsibility and care captains in the coasting trade must shoulder when navigating these shoal and fog-invested waters.

Shortly after twelve o'clock we passed between the jetties of the mile-long Nantucket breakwater and anchored inside Brant Point Light.

With no sign of a change to the weather, the Skipper took the afternoon steamer home, leaving Mitchell to several days of rest at historical, quaint old Nantucket.

Friday, 7:30 p. m., the owner, with two friends, arrived on the New Bedford boat. Mitchell was at the steamboat landing waiting, for us. Without visiting the shore, all went aboard and the start was immediately made under a moderate breeze from the Southeast and with a fair tide.

Supper was prepared underway, and nine o'clock found Great Point Light bearing due East, and the two lights of Handkerchief Light Vessel in sight. Watches were made up: Foster with the Skipper until 2 a. m., and Hallet with Mitchell, 2 to 6 a. m.

At 11:50 we passed close to Pollock Rip Light Vessel, and a little later we nearly fouled the white gas buoy in the Slue. A swift current makes across the channel.

At 12:45 we passed Pollock Rip Shoals Vessel, and a little after one o'clock the lights of Chatham were abeam. At 1:30 a. m. a heavy fog enveloped everything. The wind was increasing from the Southeast. The watch below were called on deck to help reef the mainsail. Nothing happened during the remainder of the night but the occasional hoarse whistle of a passing steamer and the pumping blast of a coaster's foghorn.

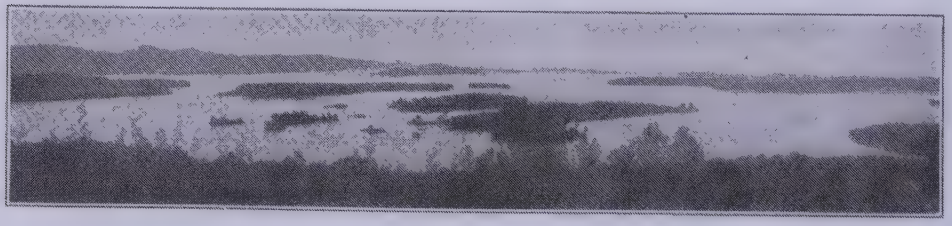
About 6 a. m., the Skipper came on deck and suggested we change our course to due West, that he might have a glimpse of the shore. With a careful lookout ahead, and after a lapse of 20 minutes or more, the low rumble of breakers could be heard, and soon looming high above us, magnified by the fog, were the mighty sandpiles of Cape Cod Highlands.

At 7:10 a. m. we distinguished the fog trumpet of Cape Cod Light—eight seconds' blast and silent 30 seconds—and of our approximate position we now felt sure. Nothing but a thick fog, and no point of observation had we had since we lost the lights of Chatham the night before. There was nothing to do but hold to our course. Hour after hour passed and no change in the conditions. The all-pervading fog enveloped everything, and it was not surprising that some of our crew felt a little peevish. A man can not come aboard, out of condition, exist through several watches on raw eggs and milk, and make an agreeable shipmate when a little hardship occurs.

At ten o'clock the log indicated that we had run close to 34 miles since leaving Chatham Lights, and our course was changed to N.W.

The wind was now working around to West of South, and at eleven o'clock the fog showed signs of lifting, and before the hour had passed, the sun shone out bright and clear. Far off to our Southeast, on the horizon, could be faintly discerned the yellow shores of Cape Cod. At twelve o'clock the wind had dropped to a light breeze and our engine was put to service. Twelve to one o'clock we logged 7.1 miles; the next hour 7.1, and two o'clock to three, exactly the same. The next hour, with a freshening wind and burning gasolene, we logged 8.4 miles, and all began to speculate what our landfall might be.

Land was sighted dead ahead and shortly, with the aid of glasses, the church spires of Marblehead could be distinguished. Soon after five o'clock the Blue Water was run past Marblehead Rock, a close haul across to Fort Sewell and a few short tacks brought us off the Boston Y. C. station, where a mooring was picked up and all made fast.



A Rope Yarn

ROPE—and a sailor's mind instantly pictures a ship. Ropes belong to a ship, in his mind's processes, and since man launched his first boat on the water, rope has been in one form or another part of a boat's equipment. Savages probably had ropes before they had boats, but with the development of boats has come the development of rope into the product of today.

Did you ever stop to think why rope is so much used aboard ships? What are the qualities which make it such a necessary part of a ship's gear? Ropes are primarily used to transmit power in a convenient way. If sailors could grasp the sail in their hands and clew it up no clew-lines would be necessary. But their arms are not long enough and the power would be spread over such a large area that it would become ineffective. A clew-line concentrates the power at the most effective point and transmits that power from that point of application to a convenient place for the sailor to apply it. An iron rod would do the same thing. Yes, but an iron rod lacks two essential qualities—lightness and flexibility. Flexibility is the cardinal virtue of a rope. When not in use it can be coiled down to a very small space and it can follow the wake of the worst helmsman without fear of breaking its back. A chain is as flexible, but its own weight is so great that it is only of value in certain kinds of work.

Ropes are made of organic material such as cotton, hemp, manila, grass, and of metals such as iron, steel, bronze and sometimes aluminum.

The class of organic materials is classified as to the material and the manner in which they are made up. Grass, manila and hemp are spun into rope while cotton is spun, braided and knitted. Braided and knitted ropes have the distinctive quality of being able to transmit torsional stresses such as a flexible shaft and are used for this purpose in the patent log-line. They also are free from turns which makes them valuable as signal halyards, though by the use of small swivels this bad feature of spun rope has been overcome for this use as signal halyard. When you do use cotton, remember it has a great ability for shrinking. Therefore, do not haul your halyards taut in dry weather and wonder why they parted in the first rain squall.

If spun rope has ruined so many dispositions by the diabolical turns which it can foul itself into—why use it? Because that very same twist--the cause of so much cursing—is the secret of its strength. Rope is subjected to a tension or pull along the line of its longest axis. The thread is made of little fibres which are twisted together. The threads are then twisted to make yarns or strands and the strands twisted or spun into rope or lines. Rope or lines are made up into hawsers.

Take a coil spring and pull out the ends. If you put power enough on the wire it straightens out. This is exactly what happens when you put a strain on a rope; the twist or turns try to straighten out, and lie in a straight line along the center. But there is yarn already in the center, and the coils are pressing in on all sides, squeezing it more and more as the load increases. Now the reason why the two first fibres clung together when they were twisted was that this same pressure made the friction between the fibres so great that they could not slide by each other. This applies to the many hundreds of fibres which make up the rope as a whole. So the harder the pull, the harder the squeeze and the harder it is for them to slip by each other. The fact that the same pieces of fibre are first on the outside and then on the inside makes all get an equal share of the squeeze. Why does this not go on indefinitely? Because up to a certain load the tendency to cling together is greater than the reaction from the center, which has to push them apart, but when this pressure or reaction becomes greater than the friction the little fibres begin to slide and the rope parts.

The smaller sizes of spun ropes of this organic class are designated by the number of threads used to make up the rope, such as a nine-thread or eighteen-thread line. The larger sizes are designated by the number of inches of circumference, such as one-inch, three-inch, etc. Hawsers are measured by their circumference in inches. Spun ropes are three-stranded and four-stranded. A three-stranded rope is more flexible than a four, but a four has greater surface area for the same strength and weight and therefore wears longer.

Hemp rope is harder and less flexible than manila and is used for standing rigging, while manila rope is used for running rigging.

Grass or corn ropes are used where the rope is submerged often, as they do not rot when damp and can be stowed while wet. They are very elastic and are specially used for towing light weights such as targets in the Navy.

Just a few hints about this general class of organic ropes:

Always dry these ropes before stowing them to prevent rotting.

Protect them from chafing by use of chafing gear or reversing end for end to bring the wear in different places.

Always coil down right-handed or with the sun.

The greater the surface the less the wear on any one strand, so use four-stranded for ropes whose particular wear is from chafing such as anchor warps, for small boats, and boat falls. A small size rope would often be strong enough but would chafe through quicker.

Metallic or wire ropes are generally either iron, steel, bronze, or combinations of metal strands spun with hemp or manila strands.

Bronze rope is used for tiller ropes because it is non-magnetic and it will not rust. This is important as tiller ropes are often in inaccessible places. If it does not pass near your compass and it is out where it can be easily examined and cared for to prevent rusting, a flexible steel tiller rope is cheaper and stronger for the same weight and also wears longer.

Galvanized iron wire is used for standing rigging and the rusting in places where turns have broken the surface coating, such as around thimbles of an eye-splice, should be carefully looked for. Most sailors think it wiser not to

paint wire rope except for decorative purposes. If it is painted, be sure to remove all grease and water from the surface.

Steel rope is used for running rigging because of its flexibility and lightness, but the majority of yachtsmen have little use for it as these boats are too small to make its use advisable.

A combination of alternate strands of wire and hemp is made into rope known as a durable rope, and is used particularly for cargo falls as it is more flexible and easier to handle.

What size of rope shall I use is a common query of small-boat sailors. The answer is: remember that most lines fail through chafing and not lack of strength, then use your judgment as to the size necessary.

How often have we seen a little 30-foot power cruiser come chugging into a harbor for a night and watch the owner bend an 18-thread line into a 40-lb anchor, tumble it over and after taking a turn on a few fathoms of line, go blissfully below to turn in for a snooze. No boat large enough to own an anchor should have a warp of less than two-inch line. Remember that it is not so much a question of length of a boat as the weight of the boat and area of surface exposed to the wind that determines the drag in the hook. A little suggestion to help in choosing ground tackle for small power boats is given in the following table:

15 to 25 feet—One 30-lb anchor and 2-inch line.
One 50-lb anchor and 3-inch line.
25 to 40 feet—One 35-lb anchor and 2½-inch line.
One 75-lb anchor and 3¼-inch line.
One 90-lb anchor and 4-inch line.
40 to 60 feet—One 50-lb anchor and 3-inch line.
One 90-lb anchor and 4-inch line.
One 135-lb anchor and 4½ to 5 in. line.

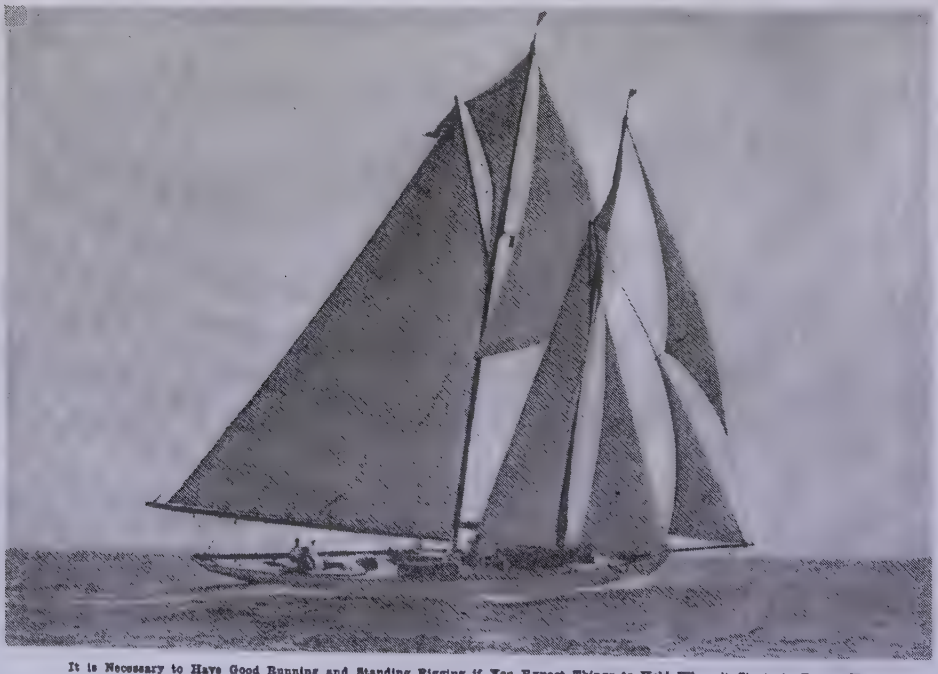
All cruisers should have at least one anchor line of at least 20 fathoms' length, in addition to the other lines.

NOTE.—Anchors of less than 50-lb weight should preferably be of admiralty type, not stockless. Personally, I would not use a stockless weighing less than 40 lb for anything but a rowboat, but there may be cases where this criticism would be unjust.

Boats above 45 feet should have chain for stream anchor. Chain is better in that it does not chafe and is much easier on a boat in a seaway. The weight of the chain acts as a spring and is less liable to drag the anchor for that same reason, as it will not bring up with a jerk.

If you use a line and anchor for the night or in a seaway, parcel the line with a piece of canvas where it leads through the chock, and watch it to guard against chafing.

Good ground tackle is good insurance if properly used. A man who begrudges a proper outfit of ground tackle is a menace to himself and all yachtsmen.



It is Necessary to Have Good Running and Standing Rigging if You Expect Things to Hold When it Starts to Breeze Up

Five Islands, Maine

By Hollis Burgess



AT the mouth of the Sheepscott River, where it widens into Sheepscott Bay, ten miles below Wiscasset, lies a little group of rocky islets known as Five Islands. Whoever has once visited this delightful region will never forget it as its scenery is not surpassed in any part of Maine, and it is a veritable yachtsman's paradise.

With deep water, a landlocked harbor, easy to enter, whether by day or night, with a score of interesting places to visit, and hospitable natives to welcome them, it is no wonder that more and more yachts drop anchor in Five Islands every Summer.

The place is easily reached from Boston either by boat, train, or automobile, by way of Bath. It is a beautiful 12-mile run on one of the Eastern Steamship Company's little steamers from Bath down the Sassanoa and Sheepscott Rivers to Five Islands. The passage is narrow and picturesque in the extreme, with roaring rapids in Upper and Lower Hell Gate and wooded islets on every hand.

Boothbay Harbor can be reached from Five Islands by an inland passage six miles long, or by sailing out around Mark Island, Cape Newagen, and the Cuckholds, a distance of about nine miles. The inside route is extremely beautiful and winds with many twists through Ebenecook Reach and Townsend Gut into Boothbay. Halfway is situated the flourishing town of Southport, where there are many hotels and boarding houses and a good many yachts are always moored here. Five Islands is also centrally located for long trips to such places as Portland, Portsmouth, Bar Harbor and Isleboro.

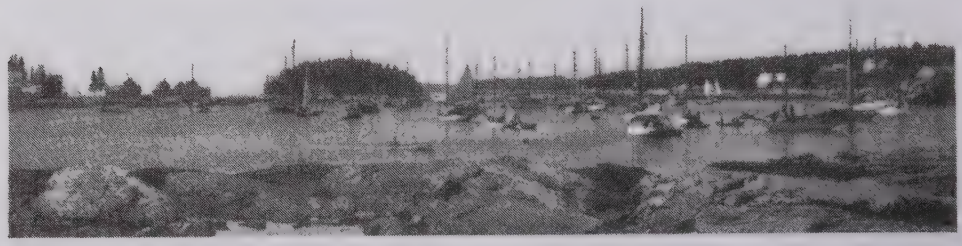
Five Islands first came into popularity with yachtsmen in the Summer of 1904, when Commodore Edward P. Boynton, of the Boston Y. C., led the club's fleet into the harbor. Together with several yachts from the Portland and Kennebec Y. Cs., the squadron was composed of over fifty craft, and they made a stirring picture as one by one they swung into the harbor and dropped anchor to the tune of the saluting cannon, which roared their echoes among the rocky crags. Ball games, clambakes, and dances were some of the entertainments and at night a great illumination was held. All the yachts were covered with Japanese lanterns and electric lights, and the surrounding shores were lined with red fire and lights of every description, making a wonderful spectacle against the dark background of pine trees.

About fifty years ago a number of persons from Malden, a suburb of Boston, went to Five Islands and lived in tents. From that developed very small cottages, until at last a postoffice was established on Georgetown Island, designated as Five Islands.

In 1902, the Rev. Nehemiah Boynton, of Medford, Mass., bought a house on one of the original Five Islands, now commonly known as Malden Island, and the Boynton family became leaders in the Summer colony. There are now seven comfortable houses on Malden Island, with a dining room and social hall, used by all the cottagers,

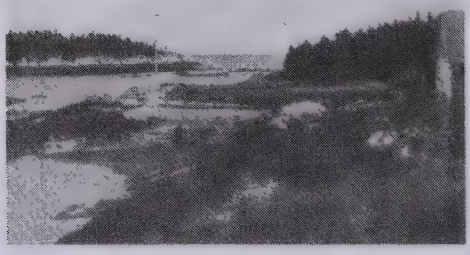


Five Islands Harbor, Looking North



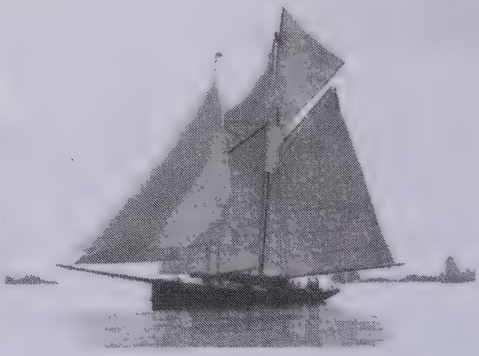
When the Boston Y. C. Fleet Visits Five Islands

which makes a charming community. The writer has been fortunate enough to visit Malden Island on several occasions and has found it a most delightful spot. On the ocean side it reaches a height of over a hundred feet and the view from there is superb. Mighty ocean surges, with a clear sweep all the way from Spain, hurl themselves on the jagged rocks with a roar of thunder. Deep chasms and caves are seen along the shore, and pine trees grow close to the water's edge. Many a visiting yachtsman has enjoyed the hospitality of Dr. Boynton and the rest of the Island Colony, and will never forget their cordial and kindly hosts.

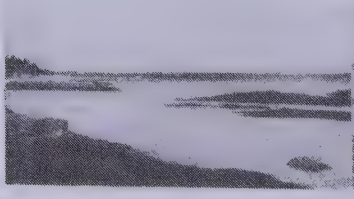


A View of Five Islands. Ledgemere Co.'s Boat Shop at Extreme Right

The Boynton family own a large tract of land on the shores of Georgetown Island, known as Ledgemere, extending for a mile on the ocean and half a mile on the beautiful Hermans Harbor. Ledgemere is one of the most interesting spots on the Maine Coast. Huge boulders, with many deep clefts and jagged rocks, line the shore and in some places the cliffs are over a hundred feet in height. Ex-Commodore Alfred Douglass, of the Boston Y. C., has a Summer cottage on Ledgemere and it is only a question of time before the cliffs are lined with houses, as many lots are being sold. Clambakes are often given on Ledgemere and the Five Islands Clambake is one of the banner events of the Boston Y. C. cruise. Clams, sweet potatoes, green corn, and eggs, are all piled on wet seaweed which is spread over red hot rocks; more seaweed is then piled on and for two hours the food is kept in steam. William L. Berry, head Selectman of the Town, who is also manager of Ledgemere, usually has charge of the "bakes" and his fame has spread far and wide.



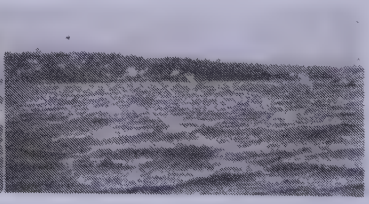
Magnolia, Formerly Owned by Commodore E. P. Boynton



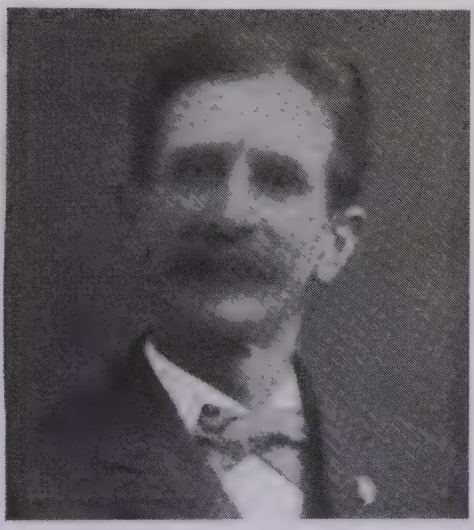
Hermans Harbor, at Extreme Right



On Board Sky Pilot, Rev. Nehemiah Boynton, D. D. (Back to Camera); M. E. Boynton, Boston Y. C., Smiling



Five Islands and Sheepscott Bay. Hendricks Head Light in Background



Wm. L. Berry, Head Selectman, and One of Five Islands' Leading Citizens

There is a boatbuilding shop on Ledgemere in which two well-known cruising sloops, Silence and Alarm, were constructed, and as every facility is offered for economical and substantial boat construction, the Ledgemere Company expects to develop a large business in boatbuilding. There is also a good-sized railway near the shop on which Commodore Boynton's flagship Magnolia, a 40-foot water-line schooner yacht, used to be hauled up.

In the Harbor of Five Islands may usually be seen the sloop Sky Pilot, owned by Rev. Nehemiah Boynton, pastor of the Clinton Avenue Congregational Church, of Brooklyn, N. Y., and one of the foremost Summer dwellers of Five Islands. Sky Pilot was built for a fishing sloop, but after one year's use was purchased by Dr. Boynton, and is known all along the coast as a very able vessel. In a strong breeze she is fast and carries whole sail easily when most yachts are double-reefed. Dr. Boynton and his brother, "Commodore Ned," as he is affectionately called along the coast, are both fishing enthusiasts, and have taken many a long cruise on Sky Pilot in pursuit of cod, haddock, pollock, flounders and the like.

About a mile North of Five Islands is an interesting place, McMahans Island, where there is a large colony of Summer dwellers, including the Hon. William C. Redfield, Secretary of Commerce, and there are many other islands nearby with cottages on them. One of the chief charms of Five Islands to the tired city dweller is its quiet and general air of peacefulness. When night comes on oil lights have to be used as there is no electric light system here. Hendricks Head Light on Southport Island, directly opposite Five Islands, with its flashing white light, guides the yachtsmen at night directly into the harbor, and off in the distance may be seen the bright lights of the Cuckholds and Seguin Island.

The natives of Five Islands are typical "Down Easters"—kind hearted, industrious, honest and hospitable. In these days of frequent strikes one rarely hears of a strike in the State of Maine, and the relationship between employer and employee is both cordial and friendly. The principal store on Five Islands is that of McMahan & Higgins, who, besides having the postoffice, sell about everything from a needle to an anchor. Mr. Charles A. McMahan, one of the partners, is well known in New England as the manufacturer of Kennebec Spruce Gum, and in the Winter he travels from State to State selling his original product. He is one of the Selectmen of Five Islands, and with Thomas W. Blaisdell and William L. Berry, chairman, make the governing trio. There are about five hundred voters in the town. The principal occupations are fishing, lobstering, farming and lumbering. Georgetown Island is ten miles long and three miles wide, and there is ample space for farming and cutting timber.

Moving pictures have not yet invaded Five Islands, and waiting for the mail to come in on the steamer from Bath is one of the chief amusements of the day. A casino offers an opportunity for dancing or amateur theatricals, and the Summer days slip by all too fast for the cottagers. Five Islands is steadily growing in popularity and bids fair to be as well known some day as Bath or Boothbay. It is an ideal place for shipbuilding and that important industry should develop rapidly here. To any yachtsman cruising along the Maine Coast, who has not visited Five Islands, the writer recommends it as a most interesting place to visit, and the Boston Y. C. has a station established here for the convenience of visiting yachtsmen. Once drop anchor at Five Islands and you will surely come again.



Winchester, Peter W. Rouss, Owner. Designed by Cox & Stevens, and Built by Bath Iron Works, Ltd.

The Restless Ocean

By Capt. Geo. S. Laing

THE sea is ever in motion, and the study of a few of the movements may be interesting. For instance, some ten or twelve currents or ocean rivers are well known to foreign-going seamen. These currents are put in motion principally by the earth's axial movements. Therefore, their performance can be pretty well relied on. In this part of the globe, the Labrador Stream and Gulf Stream are the main ocean currents. The former is icy cold from the Arctic waters, and the latter is warm from the Equator.

Another agent in the ocean movements is the sun. Within the tropics, the fierce heat of the sun heats the surface of the sea, causing the waters to expand and to overflow towards the poles. At the same time the cold of the polar regions causes an increased density of the waters on the surface. This water sinks and sets slowly but surely for the Equator.

Thus it will be seen that ocean water is either warm and on its way to the nearest pole to get cooled, or it is cold and on its way to the Equator to get warmed up again. This extract is from Keith Johnston's "Physical Geography": "That in course of time every drop of water in the ocean may pass from the poles to the Equator, and back again, and from the greatest depths up to the surface," and so it goes on for all time.

Other factors in the moving-water business are the tides and winds. Tide is caused by the action of the sun and moon on the ocean, but it is only perceptible near the shores. Twice in each day the pull of these celestial bodies, either in conjunction or opposition, causes the waters to recede from or advance upon the coast-lines. Our American lakes are too small to come under the influence of the sun and moon as regards their motions. They obey the ebb law of motion, that of getting back to the ocean, as all rivers and inland waters must do.

Winds, too, have a great effect on the busy ocean, the surface of which is blown to leeward, causing what sailors call a drift. Then the floor of the sea has a great effect on the motion of the water. Where depths vary, the fall or race happens just as you see it happening in rivers that suddenly plunge over a precipice.

A rather peculiar phenomenon is the "bore" action of sea water. The writer has witnessed this interesting spectacle in both the Seine and Gironde, the great French rivers that bear vessels to Rouen and Bordeaux, and again on the bosom of the Hoogli, near Calcutta, in India. The bore is really a fight between the ocean water and the ebb water of a river. When the flood or incoming tide advances on the coast, some rivers refuse to be overpowered and keep on emptying into the sea. The resistance goes on till a balance of power on the ocean side smashes through like a raging lion and the bore in the shape of a 20-foot wave runs up the river roaring its victory. After the bore spends its velocity, the ocean flows inland quietly until the celestial agents exercise their drawing power in the opposite direction, when the river once more empties into the ocean.

Old Father Ocean has another lively way of moving round and seeing the world. Where does all the rain come from? Where does all the beautiful fresh water of the lakes and rivers come from? Does it all come from the deep briny ocean? Yes, every drop of it.

Down in the tropics the sun pulls up by evaporation millions of tons of pure sparkling fresh water every day. The salt is left behind just as it would be in mechanical distillation. This pure water is loaded into Nature's fantastic airships—the clouds—and is borne hither and thither to nearby countries and far-off countries. Some clouds are very heavily laden and sail away at an altitude in keeping with their load. Other clouds have a smaller cargo but may go further with it before allowing it to come down in the shape of rain or snow.

The ocean has a few abnormal movements that cannot be said to be for the common good. But we just have to put up with them. For instance, tidal waves are never welcome demonstrations of the ocean's movements, and damage instead of service is the only result. Upheavals in the ocean floor seem to cause these destructive water walls. Land slides or some parts of the earth slipping into the sea while new parts come up from the ocean bed to serve as dry land have a close relationship to tidal waves. The Krakatoa and Anjer incident in Java was a case in point.

Still another motion called rollers affects the ocean. This movement is in evidence on the West coast of Africa. Small hills of water, with a valley of 20 feet intervening, roll heavily in towards the shore. These rollers never break till they come into shallow soundings, but they certainly cut up an aquatic disturbance on the beach, rendering the landing of small boats or the anchorage of large vessels a very unsafe proposition.

The whole subject of the ocean and its many performances could not be treated in an article such as this, but what has been touched on will act as foundations for deeper knowledge of the many phases attached thereto.

The ocean never rests and it takes care that no other water rests, and we see that in its service it has the winds and clouds as allies.

Vessels of all kinds take advantage of these ocean currents when their direction is favorable. Take, for instance, a steamer, cotton laden, from New Orleans or Galveston and bound for Liverpool. This steamer will be aided by the Gulf Stream motion to the extent of 300 miles on her 3,000-mile journey. That's quite a lift for nothing.

Of course, on the voyage out to the Gulf of Mexico from England the main stream is avoided and a course is taken along the edge of the current. Here at some times of the year a counter current may be experienced, in which case a vessel would be aided both ways.

In the study of winds and currents, remember that whereas a North wind would take a vessel to the Southward, a Northerly current would take her to the Northward. Or another explanation would be, a Westerly wind comes from the West, but a Westerly current goes to the West. The study of the mighty oceans will unfold many wonders.

A Design for Bulkhead Engine Controls

By An Engineer

WHEN fitting an engine into a hull not specially designed for it, it very frequently happens that the controls must be so placed that the pilot cannot conveniently manipulate them without temporarily leaving his steering wheel. This is naturally very awkward when a boat is coming alongside a pier or wharf, and may sometimes even develop into a real source of danger. In any case, the arrangement is bound to result in inefficiency since if the spark control, for instance, is difficult to get at, the pilot, rather than endanger the safety of his ship, will neglect it.

The solution of the difficulty is obviously to bring all engine controls up close to the wheel and the simplest way of doing this, when the construction of the boat permits, is to fix the whole of these fittings close together on the nearest bulkhead to the engine. Sometimes it is possible to achieve an arrangement of this kind by means of rods and bell-crank levers, but much more frequently the only convenient plan with due regard to neatness, is to make use of Bowden cables. It is accordingly a design of the last-named type which the present article sets forth to describe.

The design has been worked out to give as simple a construction as possible, without sacrificing strength or efficiency, and one point which had particularly to be kept in mind in view of limited facilities for pattern making, was to arrange the castings so as to avoid any but the simplest round cores. It was also desired that the bulkhead fitting, in order that it should look well when fixed into the boat, should have a good substantial appearance.

From the accompanying illustrations the scheme as finally adopted should be fairly clear. Figs. 1 to 4 show the bulkhead fitting and its details, and Figs. 5 to 7 illustrate the fittings for the carbureter, magneto and battery ignition timer respectively.

Taking the bulkhead fitting first, Fig. 1 shows a front and end view of it as fixed on the bulkhead, and in Fig. 2 is given a rear view, with the bulkhead removed. Fig. 3 illustrates the castings from which the main part of the fitting is made up, and Fig. 4 shows the details of the smaller parts, including the levers.

Essentially this fitting consists of three levers, *C* for the throttle, magneto timer and battery ignition timer respectively; a pivot spindle *D* for these levers; a semi-cylindrical arrangement to provide notched quadrants for the levers and a means of fixing the pivot spindle; and an adjusting plate *E*, to which the ends of the cable casings are adjustably secured.

To make the semi-cylindrical arrangement in one casting would have necessitated the construction of an elaborate pattern. It was accordingly made up out of four half circles, two of which (*A*) have bosses for fixing the pivot spindle, the other two (*B*) being cut away so as to clear the pivot spindle entirely. These four segments were obtained as shown in Fig. 3, out of two circular castings, 5 inches in diameter when finished, which are identical in all respects with the exception that in one the slot (*F*) is to the right, and in the other it is to the left. If the slot is cast, this difference can be arranged by having the center of the pattern, including the boss, made loose; or alternatively the castings can be made solid and the slots cut out as desired.

The castings are provided with lugs (*G*) to take the two securing bolts, and it will be obvious that the only core necessary is a short rod partly through the central boss. After machining, which includes turning the outside face, facing both ends, making recess and spigot as shown and boring out the boss, the castings are each cut into two halves, making four segments in all and these are machined to lines aa^1 and bb^1 for *A* and *B* segments respectively.

This enables the four segments to be bolted together as shown in Fig. 2. The two *A* segments, which carry the pivot spindle (locked to them by set-screws) are naturally concentric with it, and as the two *B* segments are maintained concentric with the *A* segments by means of the spigots and recesses, the whole fitting is concentric

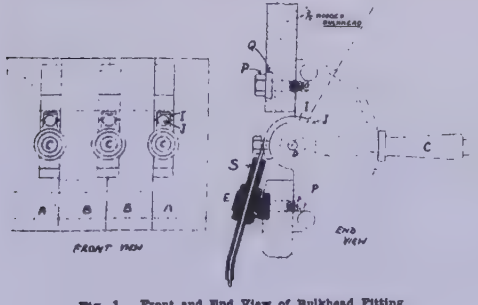


Fig. 1. Front and End View of Bulkhead Fitting

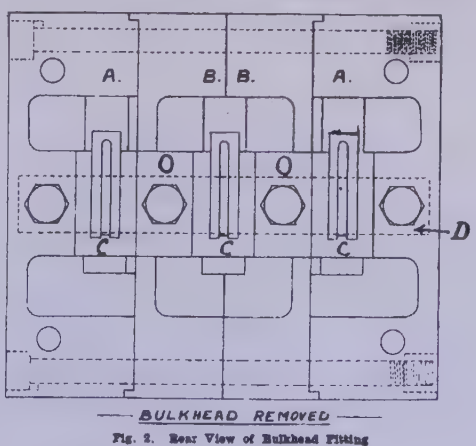


Fig. 2. Rear View of Bulkhead Fitting

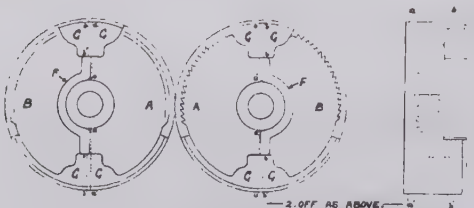


Fig. 3. Castings for Bulkhead Fitting

throughout. The two securing bolts are fitted in flush with the ends of the *A* segments, so that, when the fitting is finished off, it has a clean and solid appearance.

Details of the levers are given in Fig. 4. Each lever is a small casting with a boss to work on the pivot spindle. Round one part of the boss a small guideway (*H*) is cast to take the Bowden wire and at the end of this guideway there is a lug (*I*) with a hole for the wire drilled in it. In assembling, the wire is pulled through this hole, tied in a knot, and soldered over as at *J*. The circular guideway insures that the wire always leaves the casing centrally without rubbing for any position of the lever.

Each of the levers is fitted with a thumb-press (*K*) which, for facility in assembling, is made in two halves, screwed together. The two halves are prevented from unscrewing by a locking screw (*L*) engaging with a small featherway in the outer portion of the thumb-press. The inner portion is formed into a notching piece (*M*) which engages with the teeth cast into the segments, and so, by the aid of the small thumb-press spring (*N*), retains the lever in any set position, until released by pressing with the thumb against the spring. Distance collars (*O*) (Figs. 2 and 4) are provided to keep the levers in their correct positions on the pivot spindle.

After bolting up, the fitting is fixed to the outside of the bulkhead by means of four set-screws (*P*), which take a bearing on a securing plate (*Q*) and an adjusting plate (*E*) (Figs. 1 and 4), both of these being let into the wood on the inside of the bulkhead. A slot is also cut in the wood so that the bosses of the levers can project through towards the inside, but as this slot is hidden, all that is seen from the outside is the fitting itself in its convenient position on the bulkhead.

On the adjusting plate three lugs are cast and these are drilled out to take the adjusting screws (*S*), three of which are needed for this purpose, the remaining three being required for the fittings on the engine. The adjusting screws are bored out to take the Bowden wire casings, which are sweated into them. By means of their locking nuts the screws are then locked in position in the adjusting plate, as shown in Fig. 2, in such a position that as much of the screw as possible projects above the plate. This allows of the screw being lowered as required in order to increase the length of the casing between its fixed points and so take up any slack in the Bowden wire.

With regard to materials all parts illustrated in Figs. 1 to 4 were made in brass and gun-metal, with the exception of the pivot spindle, which was of mild steel, but a cheaper fitting, and one that would look quite well, could be turned out of malleable iron, or even ordinary grey iron castings, the pivot spindle, screws, bolts and thumb-presses being made from mild steel. The advantage of gun-metal and brass is of course their resistance to the action of salt water.

From inside the bulkhead the casings, with cables inside, are carried down to the floor, then along under-

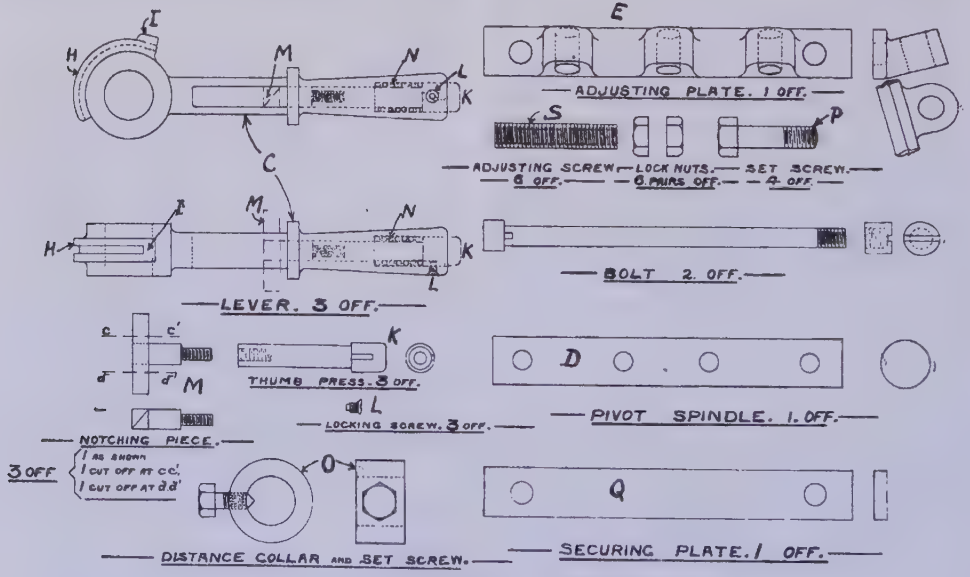


Fig. 4. Details of Levers, Plates, etc., for Bulkhead Fitting

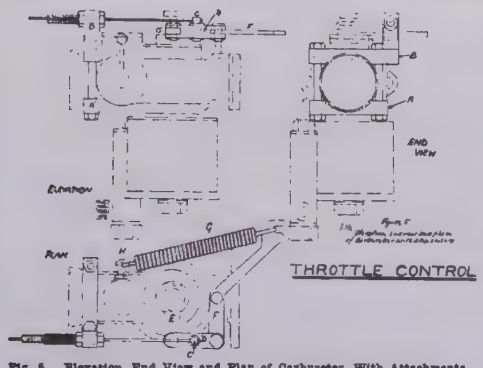


Fig. 5. Elevation, End View and Plan of Carbureter, With Attachments

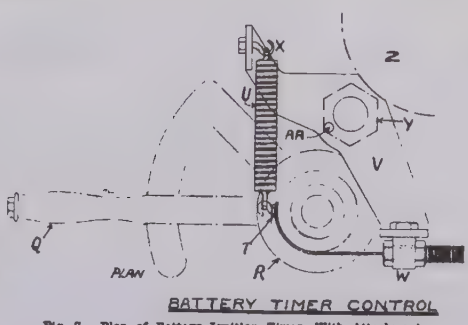


Fig. 7. Plan of Battery Ignition Timer, With Attachments

neath the floorboards to the enginehouse, inside of which they are led to the fittings on the carbureter, magneto and battery ignition timer respectively.

In altering these fittings to suit the Bowden wires, three essential things had to be provided on each fitting, namely, means for attaching the wire; a fixture to take the adjusting screw carrying the casing; and means for securing a spring which would keep the wire tensioned, and so cause it to follow the lever on the bulkhead, as the latter was let back. In all cases the attachment was made in such a way as to give a total travel for the wire, between extreme positions, of 7/8 inch. The same travel was allowed for when designing the levers.

The attachments, as used for the various fittings, are illustrated in Figs. 5 to 7. In all cases the fitting itself is shown dotted, and the attachments in full. The adjusting screws carrying the casings, one for each fitting, are identical with those already described for the bulkhead, and are sweated to their respective casings, and locked in position by lock-nuts in an exactly similar manner.

In the case of the carbureter (Fig. 5) the fixture for the adjusting screw was made in the form of a clip, which may be either of brass or wrought iron, fitted on just over the air inlet. The clip consisted of a lower plate (*A*) and an upper plate (*B*) clamped together by two bolts and the screw was carried by a lug formed on the upper plate (*B*) and drilled out to suit. The wire was attached to a small stud (*C*) carried by a short brass coupling rod (*D*). The latter was used to connect the air lever (*E*) and the throttle lever (*F*), which in this form of carbureter had to move simultaneously. A new throttle lever (*F*) was made out of brass and an extension formed on it to carry the spring (*G*) which had its fixed end secured to a small brass hook (*H*) screwed into the main body of the carbureter.

With this arrangement, when the lever is pushed downwards on the bulkhead, it opens the throttle and air valve together, by pulling on the Bowden wire. When the lever is let back again both air valve and throttle are restored to their original positions by the tension of the spring.

The attachments used for the magneto are illustrated in Fig. 6. In this case the wire was fixed to a small brass extension piece (*I*), which was secured by two screws to the end of the timing lever (*J*), and the lower end of the same extension piece was used to carry the moving end of the spring (*K*). The adjusting screw was locked into a wrought iron bridge piece (*L*), which was supported by two steel studs (*M*) secured by nuts to the base plate of the magneto (*N*). The same nuts were employed to fix a bent plate (*O*), into the lower end of which was secured a hook (*P*), to carry the fixed end of the spring. Pulling on the bulkhead lever then advanced

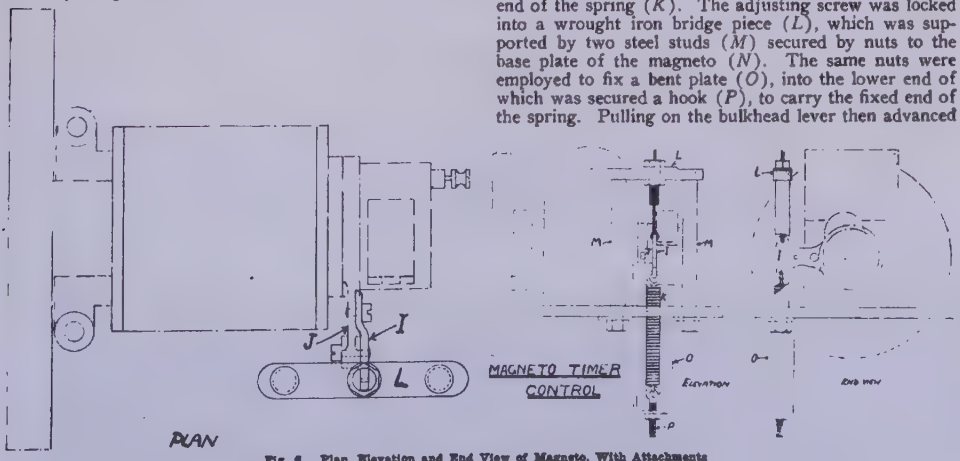


Fig. 6. Plan, Elevation and End View of Magneto, With Attachments

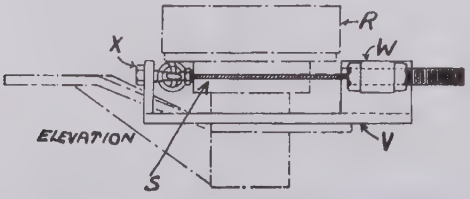


Fig. 7. Elevation of Battery Ignition Timer, With Attachments

the magneto, and letting the lever back caused the timing lever to be retarded by the tension of the spring.

It should be explained that the peculiar arrangement of the horseshoe magnets in the illustration is accounted for by the fact that the magneto was of the "Dixie" pattern, with stationary coils.

The battery ignition timer on this engine consisted of two brass contact pieces for the two cylinders, carried in an insulated casing (*R*) which could be advanced or retarded by the hand lever (*Q*) (Fig. 7) attached to the casing. A brass spring contact revolved inside the casing, and was carried by a vertical shaft driven by bevel wheels from the cam shaft. A brass collar (*S*) of suitable diameter to give the correct travel on the wire was sweated and pinned to the underside of the casing, and into this collar was screwed a small brass stud (*T*) with a hooked end, which served the double purpose of fixing the wire and securing the moving end of the spring (*U*). A bent plate (*V*) was used to carry the adjusting screw at one end by means of a small lug (*W*) bolted to the upturn of the plate, and at the other end a similar upturn carried a small hook (*X*) to support the fixed end of the spring. The plate itself was held down by one of the crankcase nuts (*Y*) close to the forward cylinder (*Z*) and prevented from turning by a small stud (*AA*). As in the case of the magneto, the bulkhead lever would be pushed down to advance and let back to retard.

Naturally, the engine attachments just described were designed to suit one particular engine, and would have to be modified for an engine of any other pattern, but it is not likely that the differences would be very great, and in any case the sketches will, it is hoped, form a useful guide to the designer. The bulkhead fitting would, of course, remain the same, whatever the make of engine. Both it and the engine fittings have proved thoroughly satisfactory in operation and an advantage they possess is that, when fixed in the boat, they have a distinctly workmanlike appearance.



U. S. S. Charleston, First Class Light Protected Cruiser. 424 Ft. Long, 66 Ft. Breadth, 22 Ft. 6 In. Draught. Displacement 9,681 Tons. Speed, 22.04 Knots on Trial Trip. Fourteen 6-In. Guns, Eighteen 3-In. Guns

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART III

AS a designer must determine the location of the center point of a boat's underwater bulk, and the location of the center of gravity point of the boat's weight, I will in this chapter briefly explain the meaning of the terms *Gravity* and *Center of Gravity;* and the calculations used by naval architects when they desire to ascertain the location of the center point of the underwater body of a boat, and the center of gravity of the weights of construction, etc.

Gravity Explained

Every particle of matter is drawn, in proportion to its mass, towards the earth's center, and it is to this tendency to move downwards in obedience to this attraction that is given the name *weight.*

The word *Gravity* carries a similar meaning, being derived from the Latin *Gravis,* meaning weight.

If a piece of iron or wood is raised in the air and the support that holds it there is removed it will fall to the ground. The force which causes it to do this is gravity.

Physically speaking, everything is made up of a multitude of small particles, called molecules or atoms, held together by cohesion and so far as gravity is concerned, each particle is drawn in proportion to its *mass* towards the earth's center; but as the force of cohesion in solids is so great that the particles composing them cannot act separately, the force of gravity can be likened to a number of forces acting in parallel lines in the direction of the earth's center.

The sum of these individual forces constitutes the aggregate gravity of each separated mass of material, and the center of these forces is called the *center of gravity* of the mass.

The law of gravitation is: Every particle of matter in the universe attracts every other particle with a force directly proportioned to the mass of the attracting particle, and inversely to the square of the distance between them.

Gravity is therefore a force that acts upon every particle of matter, and as the center of gravity of a body is the point at which the forces of gravity of that body center it is evident that if it is desired to support anything all that is necessary is to ascertain the center of gravity point and place the support immediately under it. If any mass of material is supported, or suspended, at its center of gravity it will be at rest, no matter what position it is placed in, and if suspended at any other point it will move until the center of gravity is at the highest or lowest possible position on a vertical line drawn through the point of suspension.

By lifting a solid at its center of gravity point the whole mass can be lifted in the easiest possible manner.

I will now call your attention to a most important detail. Whenever the separate particles composing a mass of material are evenly distributed throughout the whole of its bulk, as in a solid piece of iron, the center point of the bulk and the center of gravity point will be located at identically the same point; but if the particles are unevenly distributed, as in the case of a mass composed partly of iron and partly of wood, then the center point of the bulk and the center of gravity are very likely to be located at entirely different positions.

Another thing that must be clearly understood is: Each separate mass of material, regardless of size, has a center of gravity point, but when two or more separate masses are rigidly connected they must be considered as being *one* and the center of gravity point of the *whole* mass is that point at which the forces of gravity of the connected masses centers.

Structures like a boat, or a bridge, are composed of a number of separate pieces connected together, each of which, when considered alone, has a center of gravity point; but the center of gravity point of the whole structure is that point at which the forces of gravity of the whole connected pieces centers. Such a point is rightly called the point of balance.

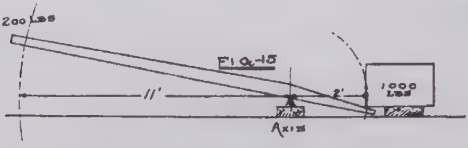
As the hull of a boat is built of unevenly distributed materials the designer must determine the location of both the center of gravity of the structure and the center of bulk of the portion of hull that will be immersed in water.

The center of gravity calculation is a weight one, made by estimating the weights of the different parts of the structure, finding the center of gravity point of each, and then calculating the moments and center of gravity point. This point is called the *center of gravity point.* Written C.G. or C. of G. The center point of bulk calculation is made by measuring the volume of the underwater body of the boat and calculating its center point in the manner explained a little further along in this article. This point is called the *center of buoyancy,* because it is the point at which the up buoyancy of the water pressing on the underwater bulk of hull centers. The center of buoyancy is usually written C.B. or C. of B.

As the word *moments,* used above, may not be clearly understood by the reader, I will explain its meaning.

The *moment* of a weight or force is the measure of its turning effect, and is the product of the force, or weight, multiplied by the distance of its application from some named point, which is usually a point of support, or an axis, or the C.G.

The two things to be considered when calculating *moment* are weight, or force, and distance; the weight being the weight applied and the distance being the measured distance from the C.G. of the weight applied to the selected point. The moment of a force is usually expressed in terms of both weight and distance, the most generally used expression being *foot-pounds.*



To explain the meaning of *moment* of force and *moment* of weight I will make use of two illustrations, one a common lever and the other a circle of homogeneous material upon which is placed a number of weights.

The illustration No. 15 shows a commonly used type of lever and I will suppose that it is desired to lift the 1,000 lb of weight and that only 200 lb of force is available. To lift the weight with that amount of force directly applied is clearly impossible, but if the force is applied at the end of a properly arranged lever of sufficient strength and length the weight can be readily lifted, because the *moment* of a force about any line or point is the product measured by the force applied and the distance of its application from the point of support or axis. And this being so it is evident that if the 200 lb of force is suitably applied at a sufficient distance from the axis to make the total moment of force greater than the total moment of weight to be lifted, the 1,000 lb can be lifted by using the 200 lb of force. The calculation is made in this manner. The turning axis has been placed 2 feet distant from the weight to be lifted, therefore the moment of weight is

$$1{,}000 \times 2 = 2{,}000 \text{ foot-pounds}$$

The force applied to lever is 11 feet distant from the axis, therefore the moment of force is

$$200 \times 11 = 2{,}200 \text{ foot-pounds}$$

And as the force moment is in excess the weight can be lifted. If it is desired to ascertain the excess moment on the force end of lever deduct the weight moment from the force moment, or if it is desired to ascertain the distance from axis that the force must be applied to produce a force moment equal to the moment of weight divide the weight moment by the force available.

$$\frac{2000}{200} = 10 \text{ feet}$$

In this illustration I have used a single weight and a single force, but should more than one weight, or force, be applied to the lever at different positions the calculation is made by determining the moment of each weight separately and adding them. The total thus obtained will be the *moment* of *all* the weights.

The moment of each force is then determined and the force moments added to obtain the *total moment of force*.

In the foregoing illustration the moments oppose each other, or act in opposite directions, hence the necessity for deducting the lesser from the greater. I will now give an illustration of a case in which there is no opposing moment:

Fig. 16 shows a circular steel plate of even thickness throughout, weighing 40 pounds, upon which is placed a number of weights, the location and weight of each being marked. I want to determine the moment of the weights and plate from the line marked *A, B*, and also from the line marked *B, C*.

I will first make the calculation from *A, B*, by measuring the distance each weight is from the line, multiplying each weight by its distance and adding totals. The calculation is as follows:

	Weight in Lbs.		Distance in Ft.		Moment in Ft.-Lbs.
Plate	40	×	6	=	240
	10	×	4	=	40
	20	×	5	=	100
	30	×	7	=	210
	40	×	8	=	320
	140 weight				910 moment

The calculation from *B, C*, is

	Weight in Lbs.		Distance in Ft.		Moment in Ft.-Lbs.
Plate	40	×	4.5	=	180
	10	×	3	=	30
	20	×	6	=	120
	30	×	7	=	210
	40	×	9	=	360
	140 weight				900 moment

Now let us assume that we want to support this plate and weights by placing a single support under it. This support must, as I have already explained, be placed directly under the center of gravity point of the combined (connected) plate and weights, and as the weights are not evenly distributed around the C.G. point of the plate, it is evident that the C.G. point of plate and weights combined cannot coincide with the C.G. point of the plate alone, which, being in the form of a circle and made of homogeneous material, has its C.G. point located at the center point of the circle. To determine where to place the support, proceed as follows: The distance that the C.G. point of the combined weights and plate is from the line *A, B*, can be ascertained by dividing the *A, B* moments by the total weight.

$$\frac{\text{Moment } 910}{\text{Weight } 140} = 6.5 \text{ feet from } A, B.$$

And the distance it is from *B, C*, can be ascertained by dividing the *B, C* moments by the weight:

$$\frac{\text{Moment } 900}{\text{Weight } 140} = 6.428 \text{ feet from } B, C.$$

The point of intersection of the two measurements is the exact C.G. point of the plate and weights; and if the support is placed at that point the whole mass will be perfectly supported because when a support is placed directly under the C.G. point of a mass of material, the mass will be in equilibrium, or will be balanced.

You can understand the importance of knowing how to determine the moment of weights when I tell you that it is by making a calculation of this kind that a designer determines the location of the C.G. point of a boat's construction and other weights. And in addition to this the same kind of a calculation is used when he wants to determine the center point of some irregularly distributed area or volume, such as a L. W. L. plane or the underwater body of a boat.

Fig. 17 will serve to illustrate how a designer calculates the C.G. of weight position of a boat.

On that illustration is shown the longitudinal view of a boat, and I have marked on it the several center of gravity points of the principal items of weight. Remember the location of each of these points has to be determined before this calculation can be made.

The line Ord. No. 1 is drawn along the face of stem, and the line *A, A* is drawn along the L. W. L. position. I am going to determine the longitudinal and vertical position of the C.G. of the weights distributed as marked on the illustration.

The first part of the calculation, to determine the longitudinal position of the C.G. point, is made in exactly the same manner that the Fig. 16 calculation is made; but the second part, to determine the vertical position, is somewhat different because some of the weights being above and some below the line *A, A*, or axis from which the moments are being calculated, it is necessary to deduct the lesser moments from the greater before the vertical C.G. position calculation is made.

This has to be done in every case when there are moments that oppose, or act in opposite directions. The complete calculation follows. Go over it carefully and make sure that you understand it.

CALCULATION TO DETERMINE THE LONGITUDINAL C.G. POINT OF FIG. 17

No.	Name of Part	Weight Lbs.	Distance Ft.	Moments
1	Stem, etc.	250	2.0	500
2	Fuel, etc.	523	4.0	2,092
3	Crew, stores, etc.	1,000	12.5	12,500
4	Keel, joiner	1,700	13.0	22,100
5	Frame, plank	2,100	13.2	27,720
6	Engine, etc.	1,800	16.75	30,150
7	Shaft, etc.	300	22.5	6,750
8	Rudder, etc.	50	25.5	1,275
		Weight 7,723	Moments	103,087

$\frac{103,087}{7,723}$ = 13.34 feet; distance C.G. of weight is aft of line Ord. No. 1.

NOTE.—I have named parts to enable you to more clearly understand the calculation.

CALCULATION TO DETERMINE THE VERTICAL C.G. POINT OF FIG. 17

No.	Weight	Distance Above line Ft	Distance Below line Ft.	Moments Above line	Moments Below line
1	250		0.5		125
2	523	1.0		523	
3	1,000	2.0		2,000	
4*	1,700				
5	2,100	0.5		1,050	
6*	1,800				
7	300		0.5		150
8	50		1.0		50
	7,723		Moments	3,573	325

Moments above line = 3,573 Greater
Deduct moments below = 325 Lesser

3,248 Moments above line

$\frac{3,248}{7,723}$ = 0.42 foot; distance the C.G. point is *above* the line *A, A*.

*These weights being on the line, there is no moment.

Therefore, the C.G. position of the construction and other weights of Fig. 17 is 13.34 feet aft of the line Ord. No. 1 and 0.42 foot above the line *A, A*. I have marked the point.

I will now explain the center point calculations.

CENTER OF AREAS

The center point of regularly shaped plane areas is always located in certain definite positions.

The center point of a circle is always located at the exact center.

The center point of a rectangle or square area is always located at the intersection of diagonal lines drawn from the corners. Fig. 18 illustrates this.

The center point of a triangular area is easily found by marking the center of each side and from these marks drawing lines to the opposite point of triangle. The point of intersection of these lines will be the center of triangle. Fig. 19 illustrates this.

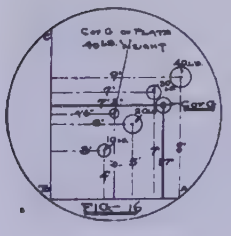
The center point of an area shaped like a trapezium is determined by dividing the figure into four triangles and ascertaining the center point of each in the manner explained above. Lines drawn from center point to center point of opposite triangles will intersect at the center point of area. Fig. 20 illustrates this.

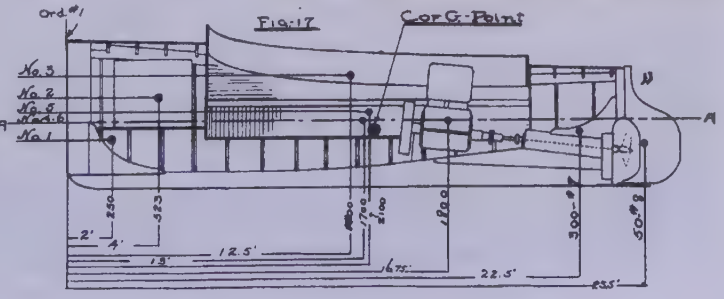
The center point of any irregularly-shaped plane area is fully determined when its position relative to *two* lines of the plane is known, and these lines are usually taken at right angles to each other.

In the case of areas having two sides alike, such as water planes of boats, it is known beforehand that the center point *must* lie along a line drawn through the center of the plane longitudinally. It therefore is only necessary, in cases like this, to calculate the position longitudinally; and this is done by determining the area and moment of the plane about some selected point (usually an end or a middle ordinate) and dividing the moment by the area. Simpson's rule is used for making this calculation, and I will illustrate the method of making it by determining the center point of water plane Fig. 8.

The area calculation has already been made and explained in Part II. To find the moment about a selected ordinate all that is necessary is to multiply the length of each ordinate by the distance it is from the selected point. These products (length × distance) put through Simpson's rule, will give the moment of the area about the selected point, and the moment divided by the area will give distance the center of area is away from the selected point.

Below I give the complete calculation and you will note by referring back to the Fig. 8 calculation that the





figures entered in columns 1, 2, 3 and 4 are the Fig. 8 area ones. The figures in the fifth column are the measured distances that each ordinate is away from the ordinate selected for the moment calculation (No. 1 ordinate has been selected), and the figures in No. 6 column are the products of Nos. 4 and 5. The No. 6 column figures are totaled and multiplied by the Simpson's rule multiplier (one-third the interval) and then by dividing the final figures of column No. 6 by the column No. 4 area figures the distance that the center point of the area is from the selected ordinate is determined. This distance measured along the base line of the figure will be the exact center point of the whole area, of which Fig. 8 is one-half.

The calculation in detail:

CALCULATION TO DETERMINE THE DISTANCE THAT CENTER POINT OF FIG. NO. 8 IS FROM THE NO. 1 ORDINATE

No. Ord.	Length of Ord.	Simpson's Multipliers	Function Totals	Moment Multipliers	Product of Moments
1	0.00	1	0.00	0	0.00
2	1.45	4	5.80	4	23.20
3	2.25	2	4.50	8	36.00
4	2.60	4	10.40	12	124.80
5	2.70	2	5.40	16	86.40
6	2.50	4	10.00	20	200.00
7	2.25	1	2.25	24	54.00
			38.35		524.40
			4		4
	One-third interval multiplier	3	153.40	One-third interval multiplier	3 2,097.60

Area in square feet = 51.133 Moment = 699.20

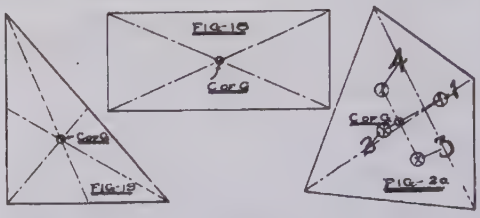
Moment 699.20 / Area 51.133 = 13.67 feet that center point is aft of the No. 1 Ordinate.

In practice the calculation can be shortened because the one-third multiplier, being common to both the dividend and divisor, can be cancelled out and the total of function column and total of moment column used for the calculation; thus

$$\frac{524.40}{38.35} = 13.67 \text{ feet}$$

CENTER POINTS OF VOLUMES

The center point of solids of regular form is always located at certain fixed points.



The center point of a sphere is always located at its center.

The center point of a cylinder is always located at one-half the height from base and on a line through the center longitudinally.

The center point of a pyramid, or cone, is always located at a point one-quarter of the height from base and on a line drawn from apex to the center point of base.

The center point of any solid bounded by a curved surface and a plane is fully determined when its position relative to *three* planes is known. The planes are generally taken at right angles to each other. In the case of the underwater body of a boat it is only necessary to calculate the position relative to *two* planes (a vertical and a longitudinal one) because the two sides of a boat being alike in shape the center point *must* lie along the middle longitudinal axis.

The center point of solids of this kind is determined by making a Simpson's rule calculation in the manner the center point of plane No. 8 was determined; but as the position has to be determined relative to *two* planes it is necessary to make two complete calculations, one being for the purpose of determining the vertical position, and the other being for the purpose of determining the longitudinal. For the vertical position the volume is calculated by using the plane area figures and the moments are generally determined from the L. W. L. plane; and for the longitudinal position the volume is calculated by using the section areas and the moments are generally determined from an end, or other selected ordinate.

Below I have made the two calculations to determine the longitudinal and vertical position of the center point of the whole underwater body of the boat of which Fig. 14 illustrates one-half. The plane area calculations for



Filer, Bertram H. and Howard S. Borden, Owners. Designed and Built by the Gas Engine & Power Company and Chas. L. Seabury, Cons. Power, Two 6-Cyl., 8-In. x 8-In. Speedway Engines

determining the volume by planes are given in Part II. The detailed section area calculations for determining the volume by section areas have been omitted, it being unnecessary to reproduce them.

The lines from which the moment calculation measurements have been taken are: For the longitudinal position, the No. 1 ordinate line; for the vertical position, the L. W. L. plane *A*.

CALCULATION TO DETERMINE THE LONGITUDINAL CENTER POINT OF FIG. 14

No. Ordinate	Area of Section	Simpson's Multipliers	Products for Volume	Moment Multiplier	Moments
Section 1	0.00	1	0.00	0	0.00
Section 2	1.662	4	6.648	4	26.592
Section 3	2.808	2	5.616	8	44.928
Section 4	3.308	4	13.232	12	158.784
Section 5	3.375	2	6.750	16	108.000
Section 6	2.808	4	11.232	20	224.640
Section 7	1.775	1	1.775	24	42.600
			45.253		605.544
			4		4
	One-third interval multiplier		3) 181.012		3) 2422.176
		Volume	60.337	Moment	807.392

$\frac{*605.544}{45.253}$ = 13.38 feet; distance the center point is aft of the No. 1 Ord.

*Here I have put into practice the cancellation of the one-third multiplier and used the total figures.

Therefore, the center point of the figure No. 14 volume is located 13.38 feet aft of the No. 1 ordinate, and 0.85 foot below the water plane *A*. And as Fig. 14 is a representation of one-half the underwater body of a boat the *center of buoyancy* of that boat, when floating to the L. W. L. plane *A*, is located at the point named and immediately over the center line of the keel.

As the calculations Nos. 14 and 17 are for the same boat, this is an excellent opportunity for me to call your attention to these things. First—the two volume calculations, one made by using plane areas and the other by using section areas, can always serve to "check" the accuracy of the volume figures. If both calculations are correct the volume figures will be alike, or within a few decimals of one another. In my illustration calculations the figures are almost identically the same.

CALCULATION TO DETERMINE THE VERTICAL POSITION OF CENTER POINT OF FIG. 14

No. Ordinate	Area of Plane	Simpson's Multipliers	Product for Volume	Moment Multiplier	Moments
Plane A	51.133	1	51.133	0	51.133
Plane B	44.266	4	177.064	0.5	88.532
Plane C	31.733	2	63.466	1.0	63.466
Plane D	16.400	4	65.600	1.5	98.400
Plane E	4.773	1	4.773	2.0	9.546
			362.036		311.077
			0.5		0.5
	One-third interval Multiplier		3) 181.018		3)
	Volume as calculated by planes		60.339	Moment	

$\frac{311.077}{362.036}$ = 0.85 foot; distance the center point is below Plane *A*.

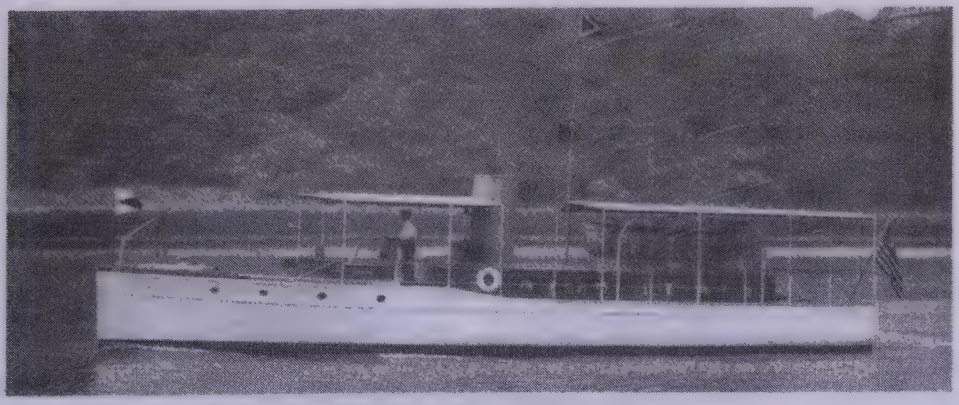
Second—I have already mentioned that if it is desired to have a boat float to a certain line the longitudinal position of the center of buoyancy (the center point of the underwater bulk) and the longitudinal position of the center of the weights) (the C.G. point) *must* coincide.

Assuming that the weight figures used for the calculation are correct the marked distribution of weights is such that the C.G. point is located at practically the same distance from bow that the C.B. point is, therefore it can be said that the boat will float exactly to the intended L. W. L., which is the L. W. L. plane *A*.

The vertical position of the C.G. and C.B. points do not have to, and, in fact, seldom do coincide.

In the next issue, I will explain the meaning of stability and the stability calculations.

(To be Continued)



Manwehu, John W. Lewis, Owner. Designed and Built by the New York Yacht, Launch & Engine Company. Power, 4-Cyl., 6½-In. x 8½-In. Twentieth Century Engine

Designs

66-Foot Power Cruiser

ONE of the most conveniently arranged power cruisers designed is from plans by Frederic S. Nock, of East Greenwich, R. I. This yacht, which is 66 feet long, can accommodate a large party comfortably and make extensive cruises. It is equipped with two 35-40-h.p. engines and has a fuel capacity of 400 gallons.

The saloon is arranged with two transom berths and backs which lift up and form upper berths. At the forward end there is a buffet on each side, with sideboard in center. At after end of saloon there is a galley with a four-hole Shipmate range, dresser, sink, provision lockers, refrigerator, etc.

The engine room is entered from hatch on port side of the steering wheel. It has the usual equipment, such as work bench, generating set, switchboard, lockers, etc. The crew's quarters forward are filled with pipe berths and transoms.

At after end of the owner's quarters there is a double stateroom, with two single berths, bureau and wardrobe. Opposite the companionway is a toilet room, and at the forward end the owner's stateroom with double berth, divan, bureau, wardrobe, etc.

The interior finish of the owner's quarters is white and mahogany trim. The engine room and crew's quarters are finished in cypress. All exterior bright work is of mahogany. A power and a rowing tender will be carried on davits.

The general dimensions are:

Length	66 feet 0 inches
Breadth	12 " 6 "
Draught	3 " 6 "

Silver Heels, 63-Foot Power Yacht

At the foot of Motor Boat Lane, Detroit, Mich., there is a shipyard. This lane runs alongside the beautiful Water Works Park, one of Detroit's show spots, and with two long canals extending about a quarter of a mile inland from the shipyard with some 200 boat wells, as the boathouses into which boats can be run and locked in behind doors are called, this is the ideal place for yachtsmen to congregate.

Hauled out in this shipyard at the American Boat Company's plant this year are forty of Detroit's best yachts, boats like the new 68-foot schooner yacht Fontenelas, owned by Dr. C. G. Jennings, the 57-foot power boat Loleta, owned by Mr. A. H. Schmidt, the Tillimook, D. C. Whitney, the Toyship, F. W. Sinks, and the famous Bettys, owned by C. W. Kotcher.

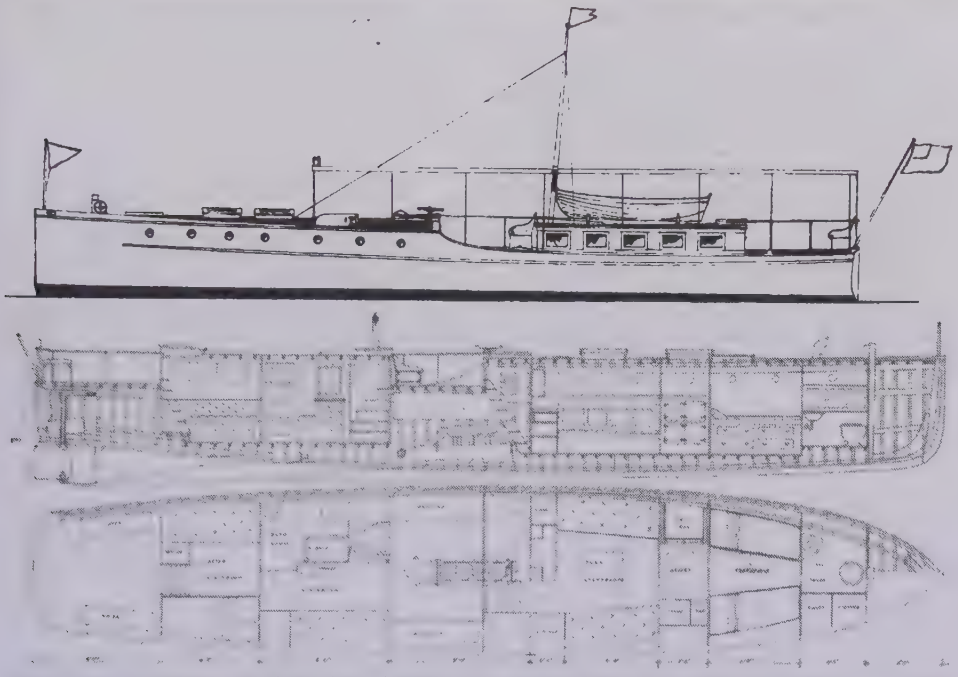
That this will be a busy yard in the Spring goes without saying; but the shop is even now the Mecca of all local yachtsmen, as besides building some half dozen of those interesting little one-design catboats, an experimental 16-footer of hydroplane model for E. A. Nelson, a 28-foot Hacker V-bottom, all mahogany construction, for W. R. Vansant, of Leesburg, Fla., there is being built a 63-foot power yacht for Mr. A. A. Schantz, general manager of the D. & C. Navigation Company, of Detroit, that is to be named the Silver Heels and will be her owner's floating home this Summer.

She is of the raised deck cruiser type with bridge deck steering and all engine controls amidships from which the boat can be operated.

The engine, an eight-cylinder, 6-inch bore by 6-inch stroke Van Blerck, is placed under the bridge deck. The



66-Foot Power Cruiser, Designed by Frederic S. Nock

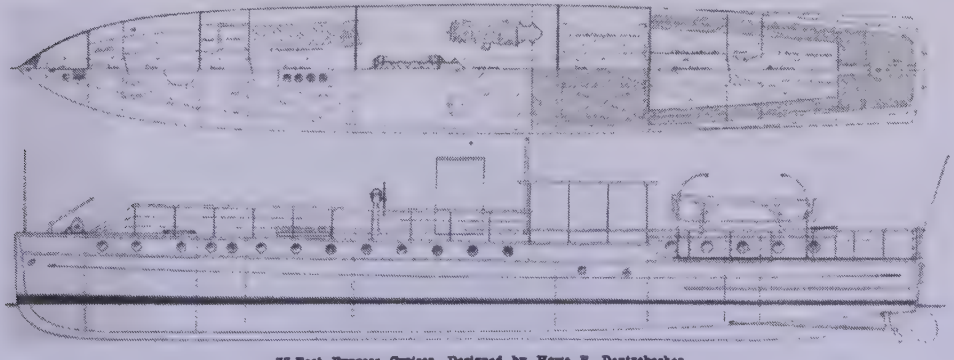


Outboard Profile and Arrangement Plan of Silver Heels. Designed by C. G. Davis and Building by the American Boat Company for A. A. Schantz

living accommodations, a large double stateroom the full width of the boat, a single stateroom and a bathroom, are aft under a trunk cabin, while forward one enters into a large living room with built-in buffet against the after bulkhead, all finished off in mahogany to wainscot height and enamel white above. All the other rooms are finished in white enamel trimmed with mahogany.

Forward of the living room is a galley fully equipped with every modern convenience, and then comes the crew's quarters, containing two large full-sized built-in berths and a separate toilet room for them in the bows.

Silver Heels will, if anything, excel the beautiful finish of her predecessor, the Venetian Maid, which the American Boat Company built a year ago for Mr. Tuller, proprietor of the Tuller Hotel, in Detroit. Silver Heels was designed by C. G. Davis, who is now the manager of the American Boat Company.



77-Foot Express Cruiser, Designed by Howe E. Dantzebecher

77-Foot Express Cruiser

Howe E. Dantzebecher, of Philadelphia, has designed a 77-foot express cruiser which has many new features. The plans are printed herewith. The hull is copper fastened, double skin, 1¼-inch thick. The inside skin is Oregon cedar and the outside mahogany below the waterline and Oregon cedar above. It is to be equipped with three eight-cylinder, 6-inch by 6-inch Van Blerck engines, which will turn wheels 26 inches by 28 inches, and according to the tests of the model, these should give a speed of 33 miles an hour. The towing tests showed a very easy model to drive, the water disturbance being very small. The deck room is large and stability tests give remarkable results for the breadth.

This yacht is to be equipped with Mr. Dantzebecher's special Pyrene fire extinguishers which work under pressure, and are always ready to turn on from the deck. There will be no gasolene in the engine room, except what is actually in the carbureters. There are four tanks for fuel, each of which will hold 257 gallons.

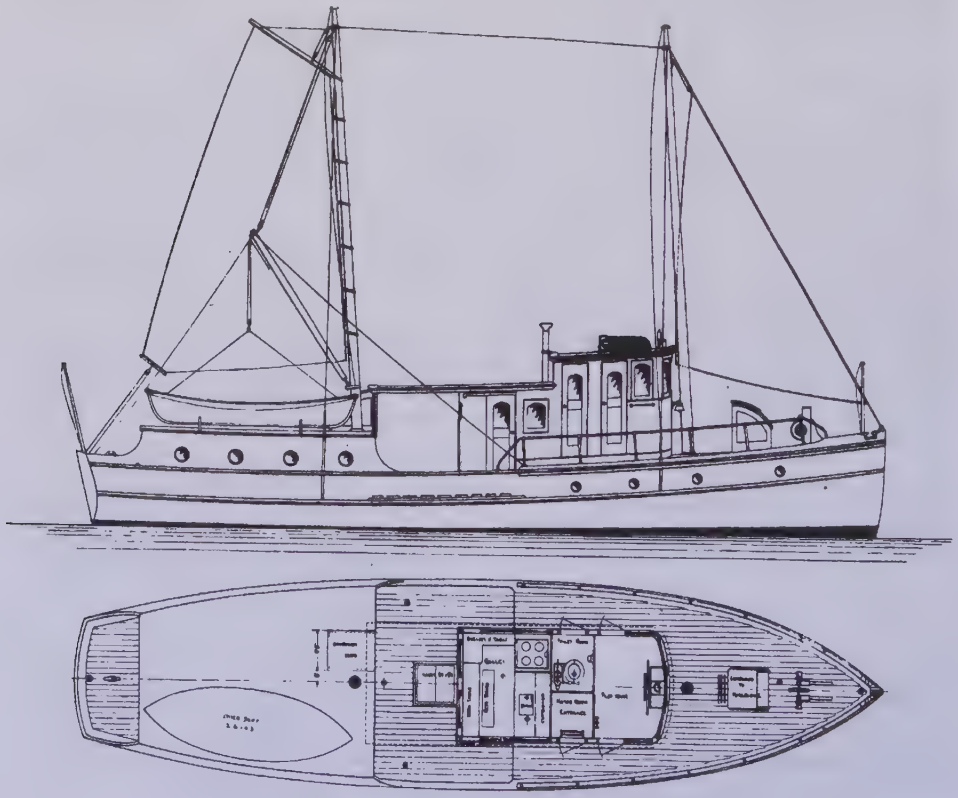
The accommodation plans show that several persons can be cared for in comfort. There is a large cabin aft forward of which is a double stateroom. The crew's quarters are forward. Aft is the galley and then comes dining room, aft of which is the engine space. The general dimensions are:

Length	77 feet
Breadth	11 "
Draught	3 "

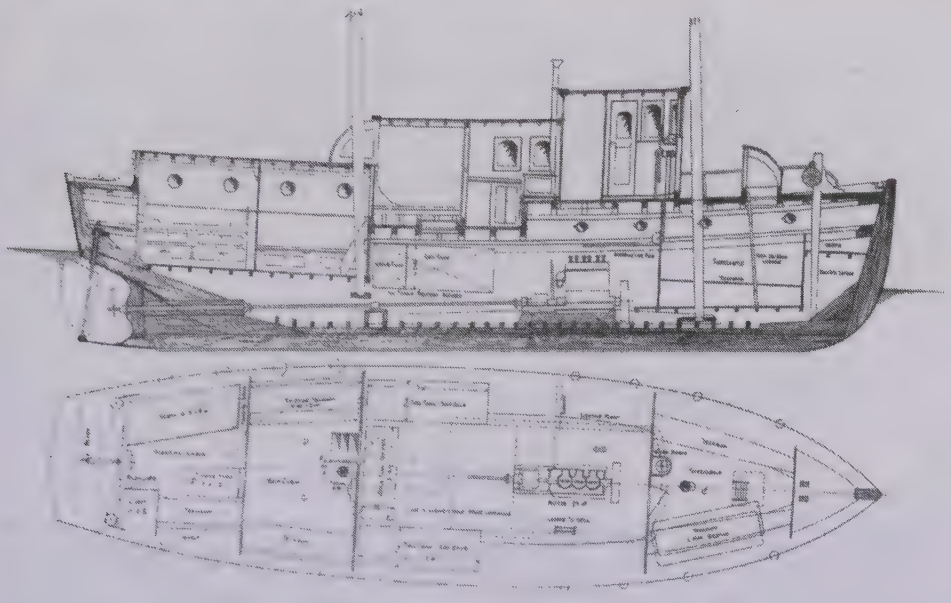
48-Foot Fish Patrol Boats

The plans published herewith show the general appearance of the patrol boats now being built at the Elliott Bay Yacht and Engine Company, Seattle, for service in Southeastern Alaska to the order of the Alaska Service of the U. S. Bureau of Fisheries. The boats are to the designs and specifications of Martin C. Erismann, naval architect, Seattle, who was awarded the work in competition.

The proposed vessels were to meet the following requirements as outlined by the Bureau of Fisheries: The boats to be not less than 40 feet in length, of plain but



48-Foot Fish Patrol Boats, Designed by Martin C. Erismann

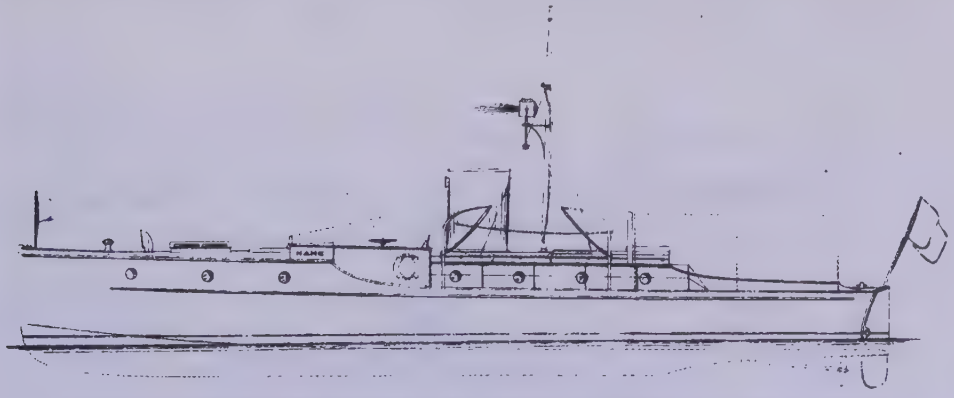


Arrangement Plan, 48-Foot Fish Patrol Boats

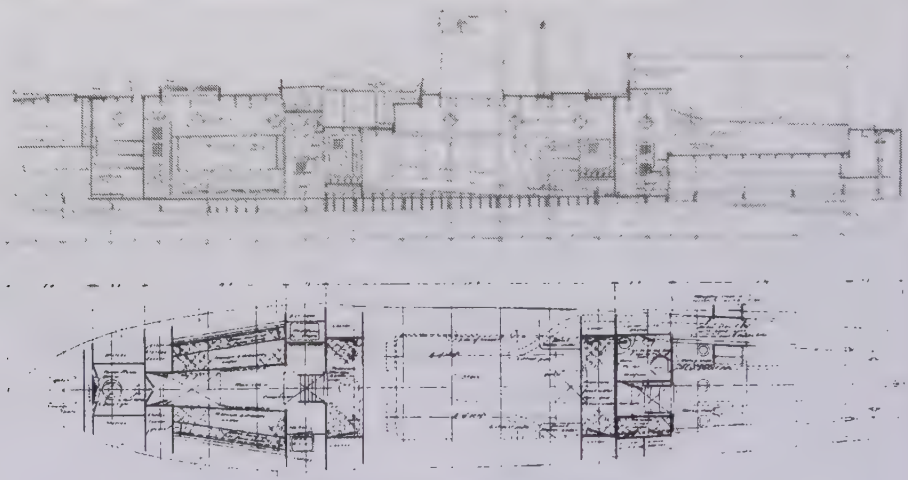
strong construction, accommodations provided for two inspectors and a crew of two men. A small rig to be arranged for emergency and a small boat to be stowed in a convenient place and to be easily launched. The engine installation to be of not less than 25 or more than 40 h.p., of heavy-duty type and to burn distillate.

The design of the boats is a development of the famous seine-boat type, used so extensively in the salmon fishery of the Pacific with, of course, such modifications in the shape of the hull as would make the boats suitable for patrol duty.

The boats have a raised forecastle on which is the pilothouse, engine room entrance and toilet. Aft of the break and on the main deck is located the galley. The main deck is to have a hatch for access to the hold, where a small amount of cargo can be conveniently stowed. Aft of the main deck there is a raised house formed by a continuation of the ship's side; here will be located the in-



Monon, 55-Foot V-Bottom Express Cruiser for Morton F. Plant. Designed by Wm. H. Hand, Jr., and Building by Robert Jacob



Arrangement Plan of 55-Foot V-Bottom Express Cruiser Monon

spectors' quarters, consisting of a saloon with extension berth and folding wash-basin, aft of which is a private cabin, with berth, wash-basin, hanging closet, transom and table.

The sail plan is adequate for use in an emergency and the boom for handling the boat, which is a 12-foot 6-inch otter skiff, is simple and efficient. The boats will each be driven by a three-cylinder, 25-h.p. distillate engine built by the Standard Gas Engine Company, of San Francisco. The boats will be electric lighted and are expected to be commissioned early in April of this year.

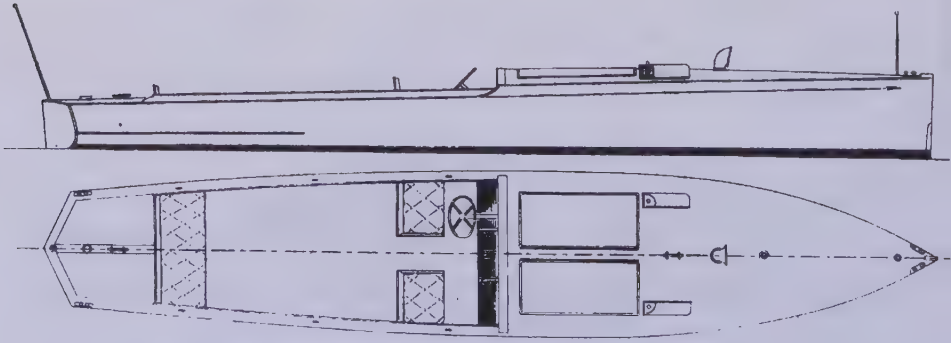
The drawings show a handsome and practical little vessel well suited to meet the Bureau's requirements for the varied conditions of their service on the Coast and among the islands of Southeastern Alaska. The Bureau of Fisheries is to be congratulated in the two little vessels it will acquire for its service. These boats would make ideal cruisers for a yachtsman that desired an able, comfortable and roomy vessel that could go anywhere; as these boats are to have a fuel capacity of about 600 gallons, they are capable of a radius of action of 3,300 miles.

The general dimensions are:

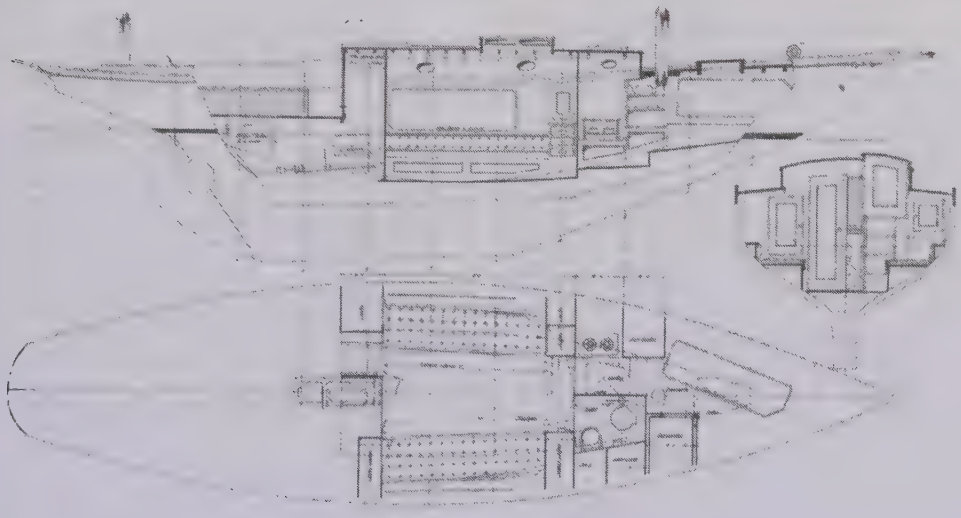
Length	48 feet 0 inches
Breadth	12 " 6 "
Draught	5 " 3 "
Power	25-h.p. Standard gas engines
Speed	8½ miles

Monon, 55-Foot Express Cruiser

At Robert Jacob's yard there is a very interesting high-speed express cruiser building from plans by Wm. H. Hand, Jr., of New Bedford, Mass., for Commodore Morton F. Plant.



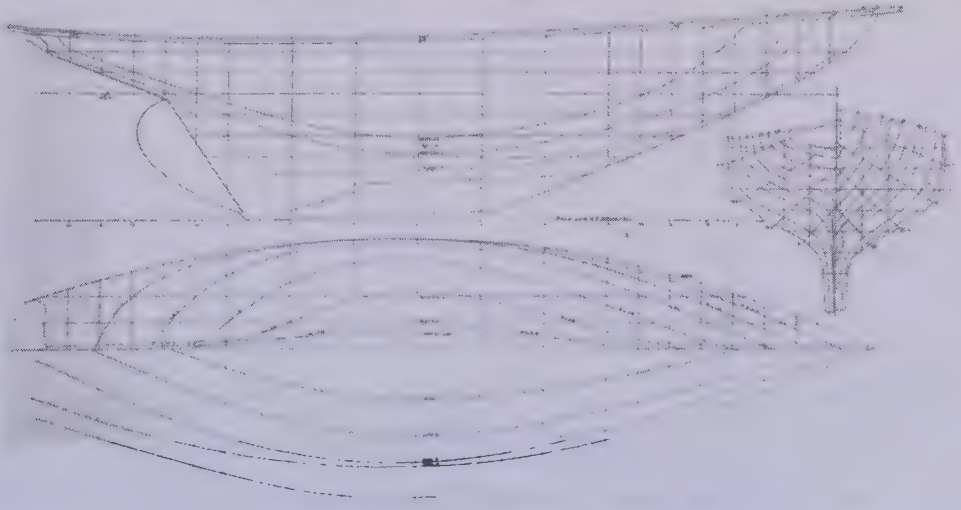
E.N.B. Special—35-Foot Standardized Boat, Designed by Elliot N. Burwell



Arrangement Plan of Cygnet

This boat is of the Hand V-bottom type, the lines of which are very similar to the 1916 champion Countess. The general arrangement is shown plainly by the plans. A comfortable cabin is provided forward, with large engine room amidships, and an extra toilet aft in end of engine room trunk. The hull is strongly, but lightly constructed. The planking is in mahogany, and double. The power plant is a pair of eight-cylinder, 300-400-h.p. Duesenberg engines, installed with full bridge control, and the guaranteed speed is 35 statute miles.

The general dimensions are: length over all 55 feet, breadth 10 feet. The hull will be finished black with white bottom, gold stripe, and mahogany deck joinerwork. Monon will be a notable addition to the express cruiser fleet and it is expected that she will be one of the fastest express cruisers out during the season of 1917.



Lines of 41-Foot Aux. Yawl Cygnet, Designed by John G. Alden

41-Foot Auxiliary Yawl

The accompanying drawings of the auxiliary yawl Cygnet were made by John G. Alden, of Boston, Mass., for George Crompton, of Worcester, Mass., and the boat was built by F. F. Pendleton, of Wiscasset, Me. The owner desired a rather large cockpit, which is 9 feet long, and a separate engine room from the main cabin.

The Cygnet has comfortable accommodations for four besides toilet room and galley with a pipe berth forward. The headroom throughout is 6 feet and 6,000 lb of outside ballast is carried besides about a ton inside. With her four-cylinder, 17-25-h.p. Sterling engine, Cygnet made about 7 miles an hour and proved herself to be quite smart under sail alone, and most successful in every way.

The principal dimensions are:

Length o. a.	41 feet 6 inches
Length w. l.	29 " 8 "
Breadth	10 " 6 "
Draught	6 " 3 "

New York Pilot Boats

We have had so many requests asking for the lines of the New York pilot boat that we requested G. B. Douglas, the well-known authority, to supply them. Mr. Douglas writes us as follows:

"I had a couple of photos of paintings of pilot boats but I wanted the lines and sail plan, so I went down to the Sandy Hook pilots' office and was lucky in finding an old pilot friend of mine in the office. He kindly lent me a half-model of a boat they had on the walls, which I took home, took the screws out, and laid out the lines, which I found to be on the scale of ½-inch to the foot.

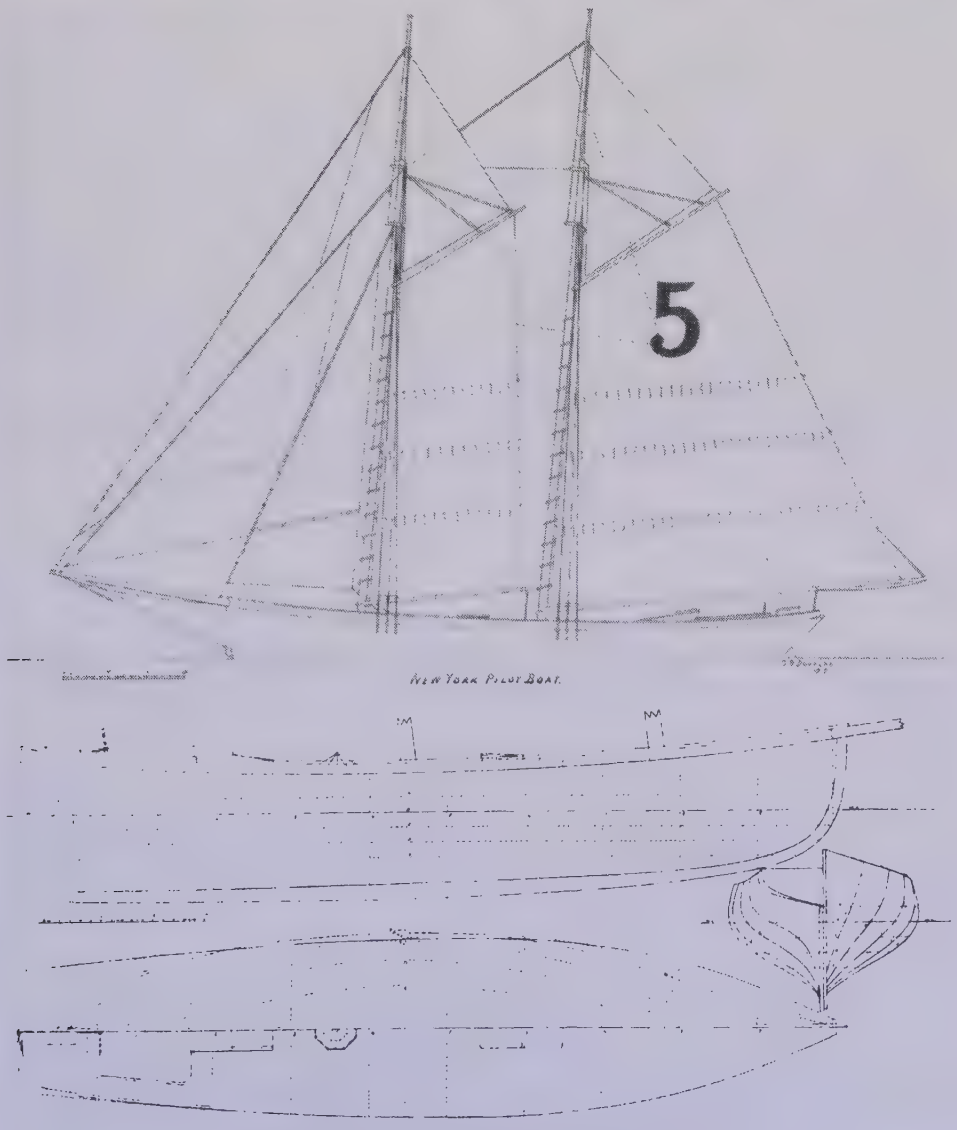
"My friend told me that Benj. Moore & Co., of 27 South Street, had made a good many sails for pilot boats, so I called there and a member of the firm kindly lent me sail plans of two boats, the Hermit, and the James Gordon Bennett. The deck fittings I had to work out from the photograph, as the boats have all been sold and none were around New York. The only one that does come here is the William H. Starbuck. She is now a fisherman, and hails from Block Island. She provokingly stayed away from New York around Christmas time,



Sail Plan of 41-Foot Aux. Yawl, Designed by John G. Alden

when I was working on the drawings, so I can not say what changes have been made on her.

"In the olden days, when the New York pilots and the New Jersey pilots were separate concerns, there was considerable opposition and the boats used to go out sometimes 1,000 miles from Sandy Hook to look for a big vessel and if two boats were in company, there was always a race to see which could land the prize. A boat built for this service, therefore, had to be speedy and seaworthy and able to stay at sea blow high or blow low.



Sail Plan and Lines of New York Pilot Boat. Drawn by Geo. B. Douglas

"Nowadays the pilots are consolidated. They have a fine steam pilot boat which cruises around a few miles from the Sandy Hook Light Ship, and puts pilots on incoming vessels and takes them off outgoing ones. The boat comes up to the city at night and lands the pilots at either Stapleton, Staten Island, or at Fort Hamilton, Brooklyn, so that the pilots can get back home again. They take turn about, some being on the boat and some in the New York office, awaiting assignments to different vessels. They have a board in the office on which the pilots' names are posted, so that they can always tell what they have to do and what vessel they have to take out.

"The boat on station, outside, always carries a large blue flag at the main truck, and in former days all the sailboats also had large numbers on the sails. This boat is No. 5. She is about 76 feet on the water-line, 18 feet breadth and draws about 9 feet.

"Pilotage is paid for at the rate of so much per foot of draught. In 1911, between April 1st and November 1st, inward pilotage was $4.88 per foot for 21 feet or over; a vessel drawing 28 feet would pay $136.64, and for offshore pilotage $34.16, or a total of $170.80. Outward pilotage was $3.56 per foot for 21 feet or over, so the 28-foot draught vessel would pay $99.68.

"The pilots generally started as apprentices on the boats, and after several years' time and passing examinations, were granted a license to take out, say, vessels of 15 feet draught, and so on until he became a full-fledged pilot and could take out any draught.

"The laws compel all vessels to take pilots unless the captain of the vessel is a regular licensed pilot for the harbor he is taking his vessel into."

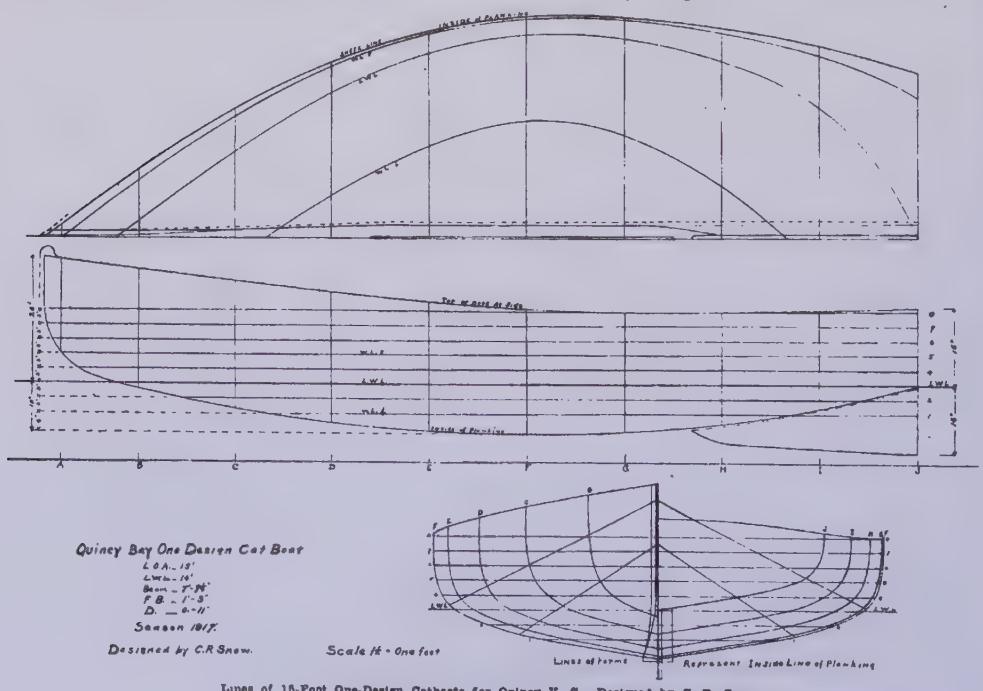
15-Ft. Quincy Bay One-Design Catboat

Quincy Bay has always been the home of enthusiastic catboat men. Their Class D made one of the scrappiest classes of the Y. R. U. of Massachusetts. This class was made up of catboats from 24 to 27 feet. Now a new class is being built.

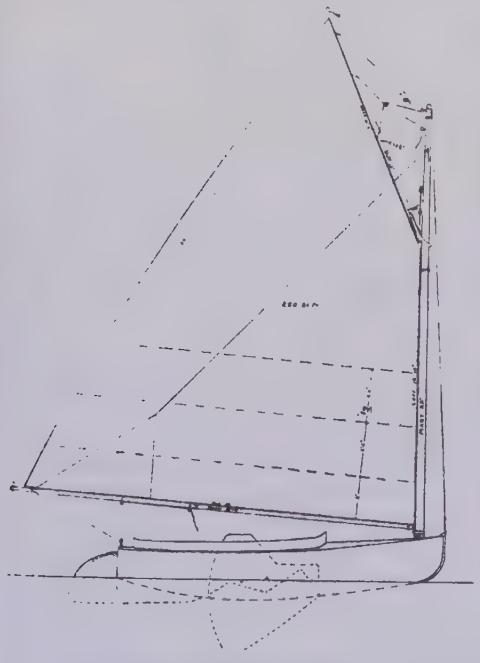
The object of this 15-foot one-design class is to keep up the interest in small-boat sailing and also to furnish racing each Saturday in the bay, rather than go chasing off each week to the different clubs. The class was started late last Fall by members of the Quincy Y. C. and the North Weymouth Club. Eleven boats were subscribed for at that time. Since then the members of five other clubs are talking of joining the class and by Spring we expect to have a total of twenty boats.

Although these boats are only 15 feet over all, they are exceptionally wide and will make a comfortable boat to race or for afternoon sailing. They will have a 150-lb iron centerboard which will be the only ballast. They will have a 9-foot cockpit with good roomy seats.

The construction calls for an oak plank keel 1⅞ by 7 inches, with a 1¼-inch deadwood and a bent stem and apron bolted to keel. The timbers are to be 1 by 1¼-inch oak and planking ⅝-inch cedar. The boats are



Lines of 15-Foot One-Design Catboats for Quincy Y. C. Designed by C. R. Snow



Sail Plan of Quincy 15-Foot Cats

being built by Willis J. Reid, of East Boston, Mass., for $200 complete, which includes Pigeon spars and Hamblin sail and cover.

Ex-Commodore Fred B. Rice has offered a very fine cup for the championship for three years' racing. It is to be called "The Frank Fessenden Crane Memorial Cup." Ex-Commodore Crane was one of Quincy's oldest racing men and he was always a staunch supporter of the catboat. A. W. Finley, another well-known Quincy racing man, has offered a cup to be given to the winner of the Quincy Club's next season's racing. This cup will be a replica of the Rice cup. Commodore Edgar W. Emery, the owner and skipper of the catboat Mudjekeewis, has offered a cup for the championship of the whole class for next season.

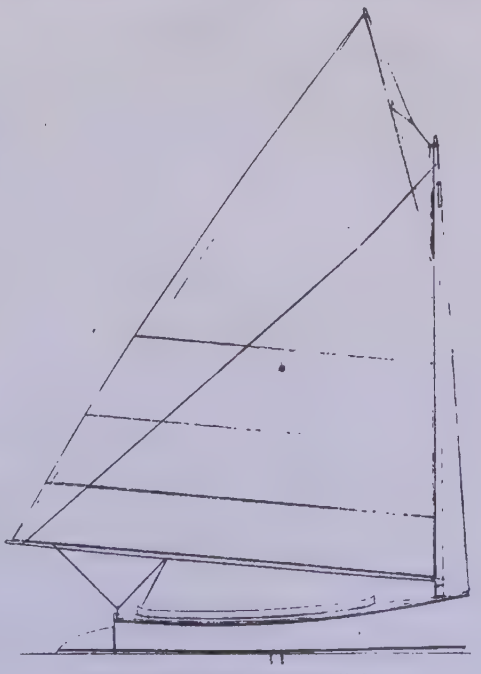
Morrisania Y. C. 15-Foot Cats

It would seem that the small catboat bids fair to be very popular once more, there being several new classes completed or underway between New York and Boston. The question of size has been exhaustively debated and limits set at 14 feet to 16 feet. The length of the Bell Class is a compromise, the 15-footer adopted being considered by the interested wise ones as the smallest desirable man-size boat.

While it is true that the boys must have these little packets to keep the game alive, it will be noticed that the "old boys" are not to be denied, for in the Harlem Y. C. 14-footers the boys weigh from 160 lb to 280 lb (O boy!) the latter being rated by an English authority as "h'all right," but to count as crew of two or undergo treatment by the toxicological expert, Professor W., for reduction.

It is reported that J. H. Curtiss, of New Rochelle Y. C., will offer a trophy for a championship to be sailed between the Harlem 14-footers and the Morris and New Rochelle (Bells) 15-footers, the difference in size being subject to the Corinthian Yacht Racing Union allowance. Opinions as to the kind of a design a boat should have are almost as numerous as the sands of the sea, and excellent ancient and modern plans appear from time to time but there always seems to be room for some improvement, especially after the boat is built.

In the Bell Class a cargo carrier was required and a large flare drawn forward on deck to make her as dry as possible in a sea; this took some of the hollow away from the forward water-lines, but did not alter their general characteristics. The Morrisania experts believe the lines aft are the most important and the tumblehome side is a good feature. Some experts may find fault with the tuck being above water (although it would be hard to draw an easier buttock) but by putting in more weight you can bring her down to suit your fancy, and consequently the more weight the faster you go. That ought to satisfy the most exacting. There have been some minor changes in the construction plan, the 125-lb center plate being hoisted from forward end of the hump, after end of mast step being lowered to meet

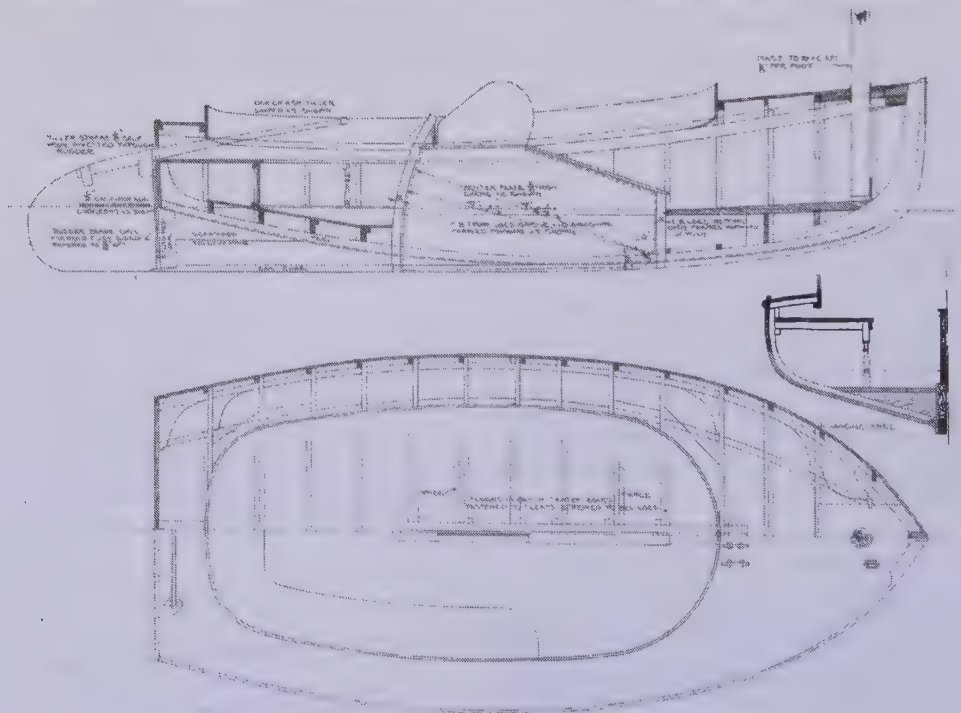


Sail Plan 15-Foot Cats for Morrisania Y. C.

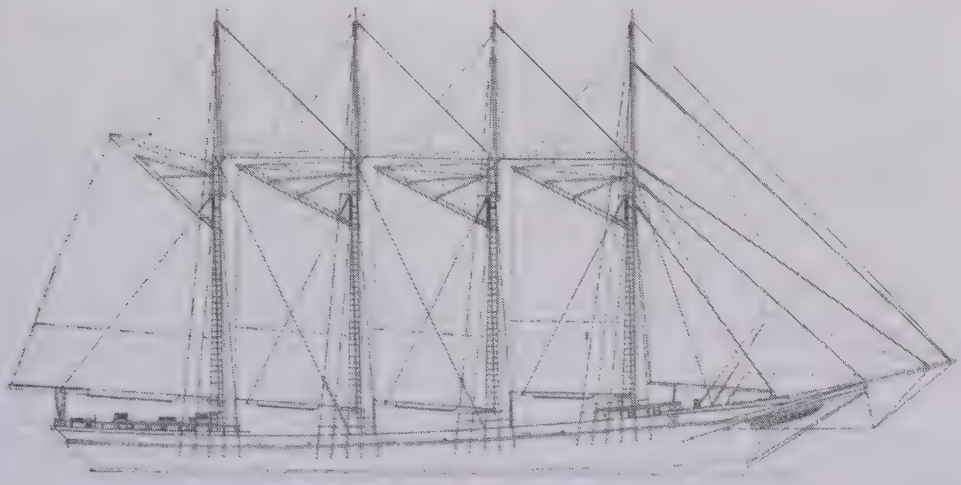


Lines of the Morrisania Y. C. One-Design Class of 15-Foot Catboats

flooring and rudder raised so as not to take the ground when beached. Deck and interior will be finished bright. The boats are being built by C. E. Johnson, of Bound Brook, N. J., and he has done very creditable work.



Construction Plan Morrisania 15-Foot Cats. Designed by Com. Edward De Levante



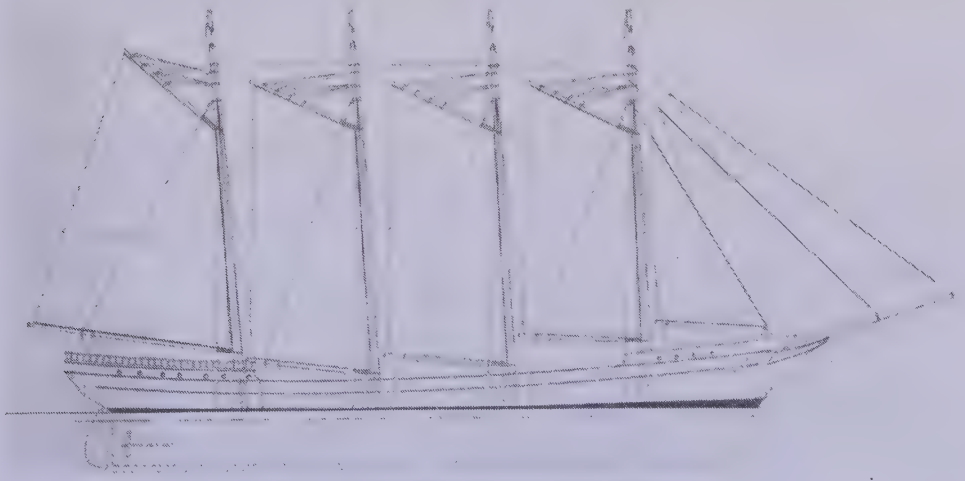
235-Foot Aux. Commercial Schooner, Designed by J. Murray Watts

235-Foot Auxiliary Schooner

The accompanying plans show a four-masted auxiliary schooner, designed by J. Murray Watts, for the Valve Sales Company. This vessel is 235 feet o. a., 217 feet registered length, 40 feet breadth and 18 feet depth. Plans and specifications conform with the American Bureau of Shipping. This firm has recently designed a large number of auxiliary commercial schooners of this type and they have proved to be fast and economical as cargo carriers. They have a cargo capacity of 2,000 tons, and are powered with oil engines of 320 h.p. The comfort of the officers and crew is well looked after, the crew having light, airy quarters in the forecastle and the officers individual staterooms in the after house. The vessel is lighted by electricity and heated with steam heat.

224-Foot Auxiliary Schooner

A four-masted auxiliary schooner for the West Coast Navigation Company has been designed by Edson B. Schock, of Seattle, Wash., the plans of which are published herewith. It is constructed throughout of



224-Foot Aux. Commercial Schooner, Designed by Edson B. Schock

Douglas fir, which is perhaps better known as Oregon pine. The construction is according to the requirements of the American Bureau of Shipping.

The capacity of this vessel as usually expressed on the West Coast is 1,400,000 feet of lumber. The crew's quarters, which are well arranged, are forward, and those of the officers are aft.

Two semi-Diesel engines of 150 h.p. each form the auxiliary power, and there is a separate 40-h.p. direct-connected generating set for electric lights, winches, etc. This vessel can carry fuel sufficient for a voyage of 10,000 miles. It is estimated that the cost of fuel and lubricating oil for a day's steady running for 24 hours will be $15.

The general dimensions are:

Length o. a.	224	feet	0	inches
Length l. w. l.	200	"	0	"
Breadth	43	"	6	"
Depth	20	"	0	"

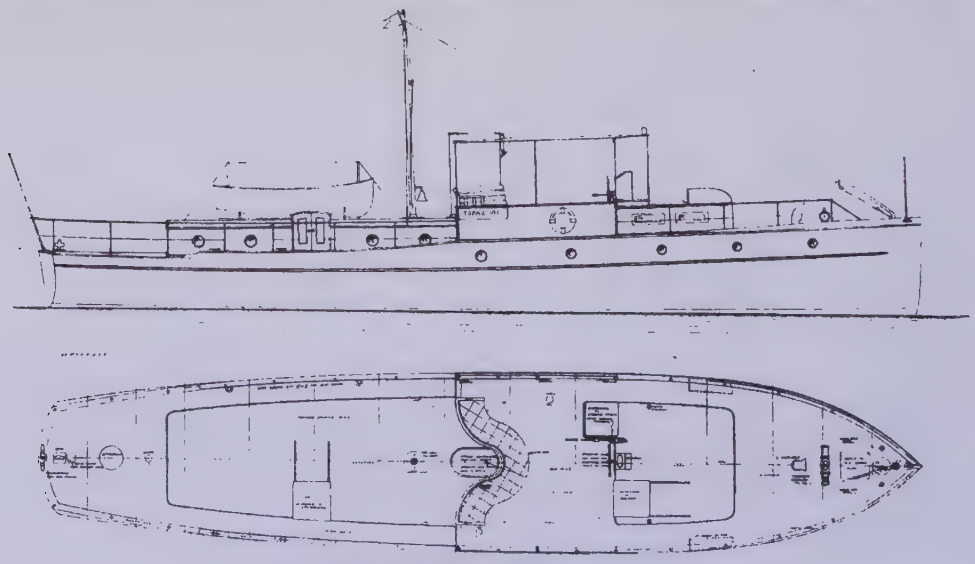
54-Foot Power Cruiser

Designs for a 64-foot cruiser and a 54-foot cruiser placed with the same architect by the same owner inside of a year is something worthy of mention. William J. Deed, naval architect, Boston, Mass., has recently completed designs of Topaz VII, a 54-foot cruiser, for C. W. Clifford, Jr., of Bath, Me., and the boat is now under construction by F. F. Pendleton, Wiscasset, Me. Less than a year ago, Mr. Clifford had Mr. Deed design a 64-foot cruiser, Topaz VI, and she was built by Pendleton.

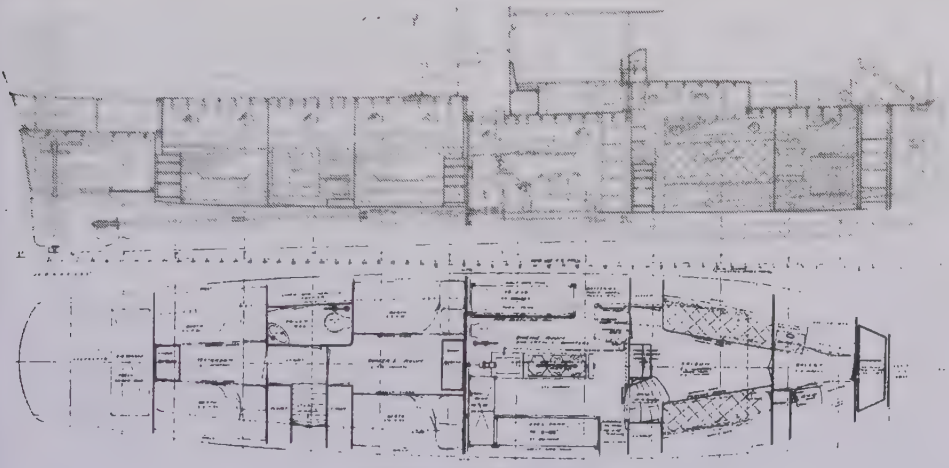
The accompanying plans show Topaz VII, now under construction. She has a clean-lined hull of very smart appearance and speed possibilities of about 12 miles with the six-cylinder, 5½-inch by 6-inch Sterling engine which is being installed. A glance at the sections will indicate a very pretty flare to the forward sections, a good midship section and an afterbody showing that Mr. Deed has given her a good clean running hull.

She is a well-balanced design with an exceptionally good proportion of deck room to interior accommodation. Her bridge will prove exceptionally attractive with the seat prettily worked in across the forward end of the cabin trunk and with wicker chairs placed conveniently inside the enclosure formed by the khaki weather cloths in the way of the bridge. All the finish is mahogany. Complete controls for the engine and boat are located at the forward end of the bridge and a glance at the deck plan will show how the helmsman is placed in a sort of recess in the aft end of the cabin trunk so that the bridge is clear for the owner and guests. The engine room hatch is to port of the helmsman and to starboard is the entrance to the saloon. This room is 8 feet 5 inches long, containing two transom berths, closets, buffet with leaded glass doors, and doors leading to the engine room in case of emergency and to the galley; in this saloon there is fully 7 feet 6 inches headroom under the cabin trunk and 5 feet 10 inches under the deck beams. Forward of the saloon is a galley very completely equipped and extra large size, measuring 4 feet 10 inches length of floor space.

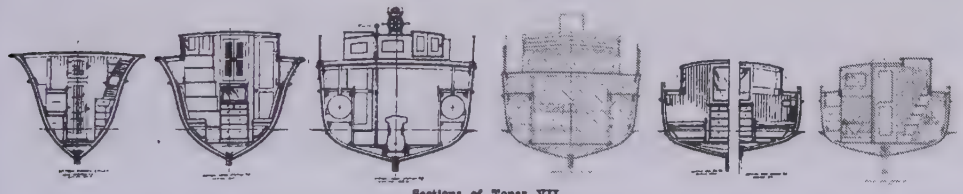
In the engine room, where there is 5 feet 6 inches headroom, are fuel tanks containing 256 gallons of gasolene, 52-gallon lubricating oil tank, batteries, tools, spare parts, etc., has pipe berth and toilet for paid hand and an iron ladder leading to the bridge. Aft of the engine room is a double diagonal-planked watertight bulkhead. The shaft running through a stuffing-box. The exhaust from the engine and the smoke pipe from the galley are led up the stack, which also ventilates the engine room.



Topaz VII, 54-Foot Raised Deck Cruiser, Designed by Wm. J. Deed, Jr.



Arrangement Plan, 54-Footer, Topaz VII

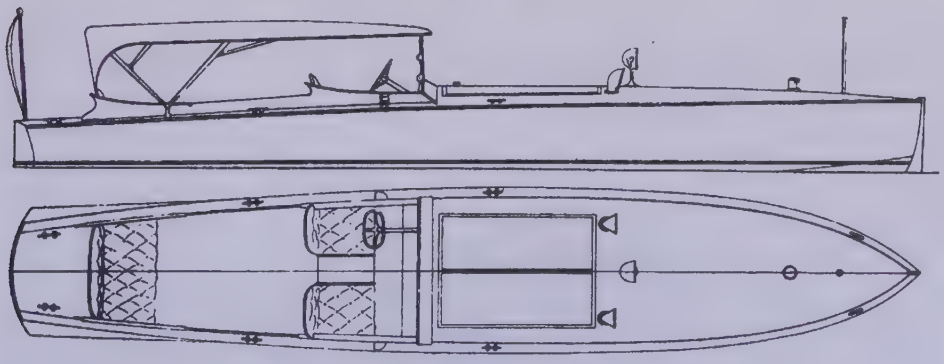


Sections of Topaz VII

The staterooms, with toilet room, open off the vestibule aft. In each stateroom there is over 6 feet clear headroom, a bureau, closet, and two 6 feet 6 inches by 36 inches berths. Under the after deck is a 210-gallon fresh-water tank, supplying lavatory and galley. A careful inspection of these plans will indicate that nothing is lacking to produce an exceptionally attractive cruiser offering possibilities for covering a good cruising radius in any kind of weather.

The general dimensions:

Length o. a.	54 feet 0 inches
Breadth	11 " 0 "
Draught	3 " 9 "



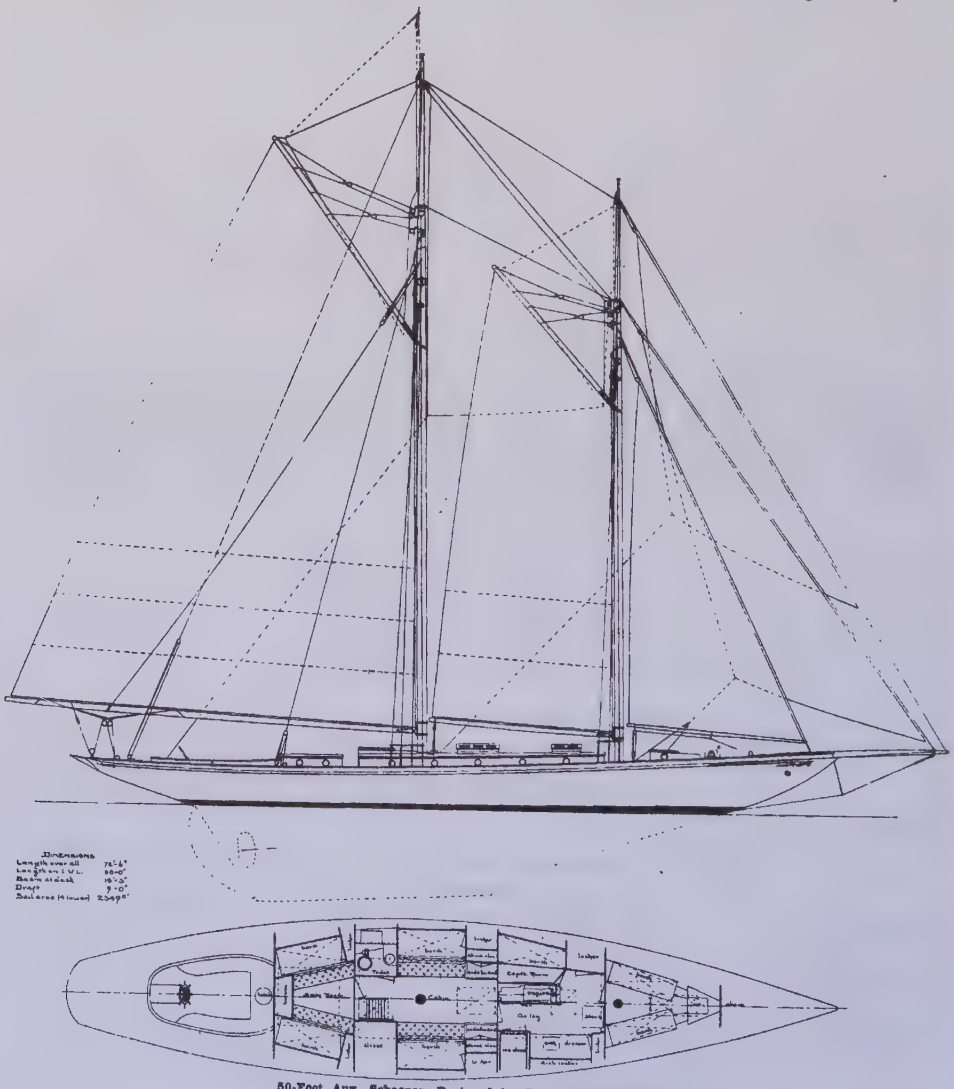
Profile and Arrangement Plan of Niagara, 32-Foot, V-Bottom Runabout

50-Foot Auxiliary Schooner

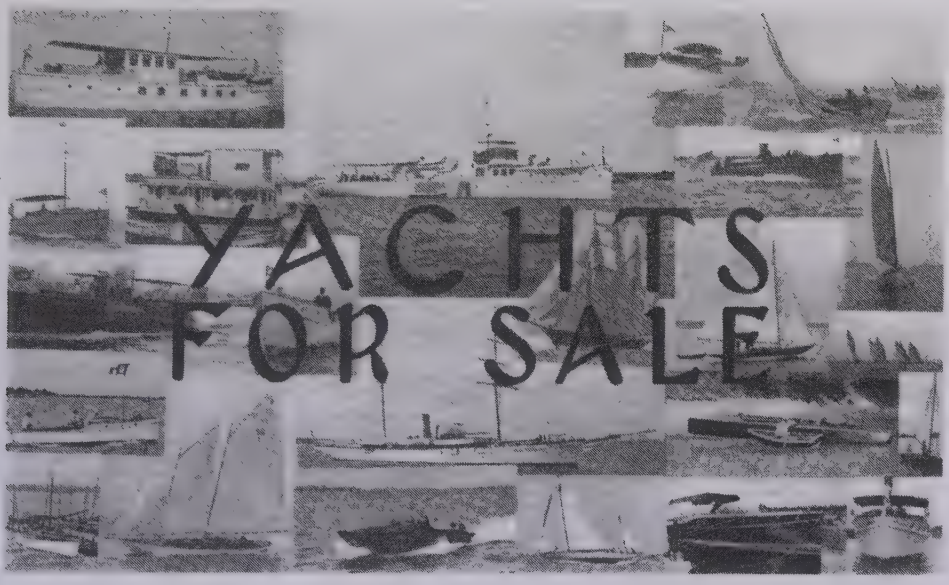
B. B. Crowninshield has designed a 50-foot water-line auxiliary schooner for an Eastern yachtsman which is now being built and will be ready for the coming season. The yacht will be plainly but well built and so rigged, arranged and finished that she can be kept in order and handled under lowered sails in any ordinary weather by two men, but she has accommodations for three.

Aft there is the usual double stateroom with generous lockers, a chest of drawers and two sofas which can be pulled out to form extra berths. Abreast of the companionway is a toilet room to port and a big clothes locker to starboard. In the cabin are two berths and two pull-out sofas, forward of which are a clothes locker, a china closet and a buffet on both sides.

The galley and engine room is large and airy. The



50-Foot Aux. Schooner, Designed by B. B. Crowninshield



THE publication of the "illustrated list of yachts for sale" is always pleasing to enthusiasts. It is a sign of the approach of the yachting season. As an omen that Winter is over, it is more reliable than the appearance of the ground hog. For many months the yachts have been covered up to protect them from the Winter's storms, but with the "Yacht For Sale List," fitting-out starts, and covers are soon removed.

This list was first published in THE RUDDER of April, 1897; it filled nine pages, and had twenty-three illustrations. Since then it has grown in size and has become an annual institution.

In advertising a yacht for sale it is very important that a picture of the yacht should be shown. The very best description written will not always make the picture of the vessel as attractive as it often is. Then, too, many of those who wish to purchase think, when reading an advertisement, "If I could only see this yacht I might buy, as it seems to be just what I want." Just how many yachts have changed owners through the "Yacht For Sale List" since it was first published twenty years ago cannot even be estimated. Thousands of yachts have been advertised and a very large percentage of these have been sold.

The "Yacht For Sale List" has a fascination, too, for nearly all yachting enthusiasts, as well as those who are looking for a new vessel. Yachtsmen look at the pictures and study the descriptive matter, while others who would like to own a yacht, perhaps, break the tenth commandment when they see these pictures of dainty sailing yachts, commodious power craft and luxurious steamers.

Sometimes one wonders why there are so many yachts for sale. Probably 90 per cent of the yachts in these waters are for sale, but many of them at a prohibitive price. With others their owners want to make changes. Perhaps the yacht is too small for their requirements and if it can be disposed of another will be bought. Then it is possible that the owner has graduated from the class in which he has been racing and can afford a larger and faster vessel, or perhaps he has become tired of the type he has been using and wants to experiment in another. The cost of offering a yacht for sale in this list is very small, and at a small outlay the yacht may be sold.

There are just as many looking for yachts as there are yachts offered for sale. Some of the yachts offered will be in great demand. Others may hang, because of age or being out of fashion. It is certain though that many yachtsmen are waiting for this list before making their plans for the coming season. It might be well to give a word of advice to those who intend purchasing. Let some experienced man see that the yacht to be purchased is properly surveyed. Paint and varnish will cover many weaknesses and blemishes. A novice will not understand how to look for these weaknesses while a surveyor will tell in a few minutes if a hull is sound and if it is not just how much work will be necessary to make it sound and the cost of that work.

If you do not find what you want in this list, consult a broker. Every broker has a long list of yachts which he can offer for sale, and these lists include nearly every yacht afloat. THE RUDDER list this year, however, is a very varied one, and while there should be some yacht described that should fit the requirements of anyone, that one yacht may be snapped up as soon as the list is published.



14868

No. 14868—For Sale—Auxiliary polemast keel yawl, 53 ft. o. a., 38 ft. w. l., 13 ft. 8 in. beam and 7 ft. draught. Gross tonnage 20, net tonnage 19. Designed by Gielow and built by Byles at City Island, N. Y. Very well constructed with 8 tons lead on keel and 3,000 lb of inside ballast. Roomy cabin with 6 ft. 2 in. headroom, finished in butternut and mahogany. Two berths and two comfortable transoms in cabin. Owner's stateroom on starboard side, amidships, with bureau, large locker, and lavatory. Toilet room opposite on port side accessible both from stateroom and cabin. Unusually large galley, 6 ft. long, extending full width of boat with coal range, large ice-chest, etc. Equipped with a 7½-h.p. Lathrop motor under cockpit floor. Quadrant steering gear, windlass, binnacle and compass, awnings, etc. Copper water tanks, almost new, holding over 100 gals. This very desirable yacht may be inspected at Newport, R. I., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

No. 14881—For Sale—Exceptional Bargain, auxiliary cruising yawl, 44 ft. o. a., 33 ft. w. l., 11.7 ft. beam and 6 ft. draught. Designed by I. B. Mills and built by Hodgdon Brothers, at East Boothbay, Me., in 1902; 9-h.p., 2 cyl. 1908 Palmer motor under cockpit floor, entirely out of sight, which will drive her 6½ miles per hour under power alone. This yacht is very strongly constructed and is extremely stiff, able and seaworthy. Her cabin is divided into two rooms with two berths and two transoms in each room, with 6.2 ft. headroom the entire length. Splendid boat for two married couples, the two cabins affording complete privacy. Acetylene and electric lights throughout. Toilet and lavatory in forward cabin; pipe berth in the forecastle, stove, ice-chest, etc. Sail area 1,127 sq. ft. Very large cockpit, easily seating twenty persons. Unusually complete cruising equipment, including tender, hair cushions, lights, binnacle, etc. This very desirable yacht can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14881

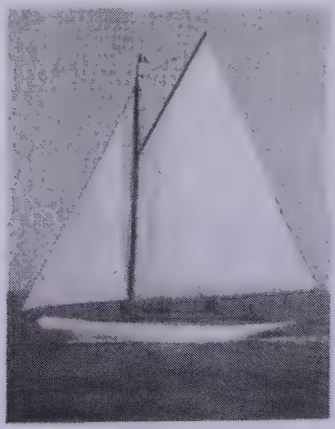


14750

No. 14750—For Sale—Fast and seaworthy auxiliary sloop Narosa, 36 ft. o. a., 26 ft. w. l., 10 ft. beam, 5 ft. 6 in. draught. Oak and cedar hull; mahogany cabin and cockpit; white mahogany inside finish; about 4,000 lb outside lead ballast. Sleeps four in cabin, one in forecastle. Good w.c.; fresh-water tank with galley pump; sails new 1915. 5-h.p. auxiliary motor giving 5 knots speed under power. Good outfit. Good comfortable and safe cruising boat for a moderate price. George B. Drake, 17 Battery Place, New York City.

* * *

No. 12174—For Sale—This attractive keel auxiliary sloop is offered at a very low price for immediate sale. 39 ft. o. a., 24 ft. w. l., 11.6 ft. beam, 6 ft. draught. Exceptionally well constructed. 6 ft. headroom. Large and airy cabin with toilet and galley. 10-h.p. motor, new 1913. Speed, 5 miles. Completely furnished and mostly renewed two years ago. Lead ballast. Bargain. Full particulars from Stanley M. Seaman, 220 Broadway, New York City.



12174

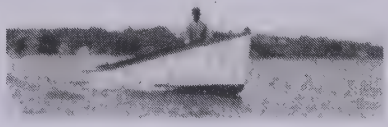


14854

No. 14854—For Sale—Auxiliary yawl, 34 ft. o. a., 25 ft. w. l., 10 ft. 6 in. beam and 5 ft. draught. Has 7-h.p. Bridgeport motor which can drive her 6 miles an hour under power alone. Roomy cabin with 5 ft. 10 in. headroom. Extension transoms comfortably sleeping four people. Pipe berth forward, toilet room aft. Complete inventory, including transom cushions, Shipmate range, brass sailing lights, awnings, 5-in. compass, 70-lb ice-chest, cooking utensils, chinaware, etc. A perfect single-hander. Has cruised extensively along the New England coast with great comfort. Good sea-boat and very stiff. Bargain price, $550. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14856—For Sale—21-ft. power boat built by Guy W. Gardner at Swampscott, Mass., in 1916. 6 ft. beam. Equipped with a 5-h.p. Lathrop engine. Strongly constructed. 8-ft. cockpit. Engine covered by a sliding hatch. 20-gal. gasolene

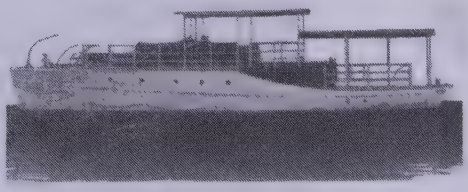


14856

tank. Wizard magneto. 25-lb anchor, 40 fathom cable, oars, etc. Highsided and very dry in rough water. Price, $350. May be seen at Swampscott, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass. Telephone, Main 23.

* * *

No. 8045—For Sale—This unusually able cruiser is offered to close estate, and will be sold at very low price. 53.6 ft. o. a., 11.5 ft. beam, 3.6 ft. draught. Designed and built by Charles L. Seabury & Co., at cost of over $12,000. Stateroom and saloon berth six. Mahogany finish. 50-h.p. Standard engine. Electric lights. Fully furnished. Capable of any sort of cruising. Address Stanley M. Seaman, 220 Broadway, New York City.



8045

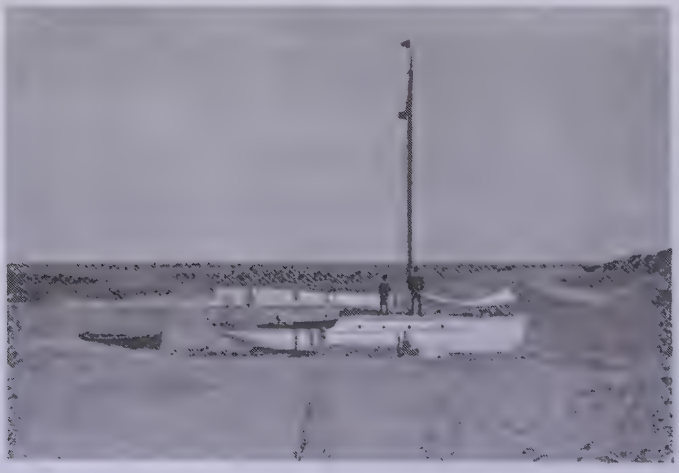


14849

No. 14849—For Sale—30-ft. motor boat. Designed and built by Murray & Tregurtha Co. at South Boston, Mass., in 1914. 6 ft. 10 in. beam and 2 ft. 7 in. draught. Equipped with a 16-20-h.p. Murray & Tregurtha motor. Mahogany finished throughout. Spray-hood covering entire boat. Beautifully constructed in the usual high-grade Murray & Tregurtha manner. Copper fastened. Bronze fittings, etc. Complete equipment, including flags, fenders, life-preservers, cushions, and lights; in fact, everything required by the Government regulations. A first-class boat in every respect. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14852—For Sale—Auxiliary raised deck launch, 37 ft. 4 in. o. a., 28 ft. 6 in. w. l., 9 ft. 10 in. beam, 4 ft. 6 in. draught. Designed by Fred Lawley and built by George Lawley & Son Corporation at South Boston, Mass., in 1909. Equipped with a 20-25-h.p. Blount & Lovell motor in 1912, thoroughly overhauled and in perfect condition. Speed 8½ miles under power alone. 3,000 lb outside lead ballast, 900 lb inside ballast. Centerboard houses entirely under cabin floor. Sails made by Cousens & Pratt in 1914, 650 square ft. in area. Cabin has full headroom and is finished in butternut. Two extensive transom berths making very wide beds. Berth for man forward, toilet, wide dresser, with a sink, large refrigerator, dish locker, etc., 9 ft. water-tight cockpit, 75-gal. gasolene tanks giving a cruising radius of 350 miles under power alone. In the center of the cockpit is a mahogany box hatch which covers the motor, sheltering it from spray and rain and serving as a seat. Water-tight bulkhead separates the engine compartment from the cabin. Deck trimmings and fittings throughout all mahogany. This is one of the best single-handers ever built and is constructed in the usual high-grade Lawley manner. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange St., Boston, Mass.



14852

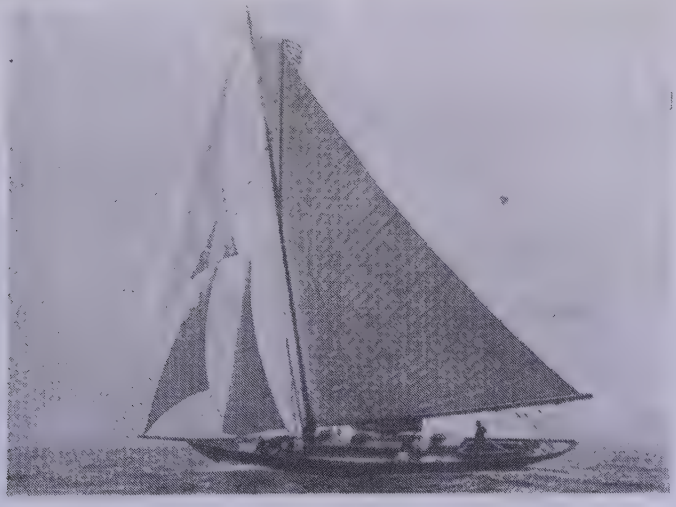


14846

No. 14846—For Sale—Raised deck fast motor boat Penguin, 42 ft. long, 9 ft. 9 in. beam, 3 ft. 3 in. draught. Designed and built by Elco Company at Bayonne, N. J., in 1911. Equipped with a 50-85-h.p. 1916, six-cylinder Sterling motor. Cruising speed of 15 miles per hour. Maximum speed of 18 miles. Bosch electric starter and electric lighting system. Sleeps four comfortably. Mahogany finish in cabin; toilet, 50-gal. water tank, 100-gal. gasolene tank, two electric searchlights. Cushions for cabin and cockpit. Controlled from cockpit. New awning, two anchors and two 150-ft. chains. Military mast, flags. Tender, which is carried on davits. Boat is completely equipped. May be seen in New York by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14848—For Sale—Keel cruising sloop. Gross tonnage 22, net tonnage 19. 62 ft. o. a., 41 ft. w. l., 13 ft. 6 in. beam and 8 ft. 3 in. draught. Built in 1910 by Lawley from designs of Crowninshield. Exceptionally well constructed as she is double planked, with outside planking of mahogany. White oak frames and copper fastenings. Very handsome white pine deck, 17,900 lb of outside lead ballast on keel and 2,000 lb inside lead ballast. Mahogany house and deck trimmings throughout. Roomy cabin with 7 ft. headroom, beautifully finished in mahogany and white. Large double after stateroom. Hollow spars. Cousens & Pratt sails, 1,920 sq. ft. in area, good as new. Cabin and stateroom well lighted by skylights and ports and each have separate lavatory and toilet, also two berths in cabin and two in stateroom. Three extension transoms, three berths forward for crew. Acetylene lights. Crew's toilet forward. Carries two boats on davits, one a 13-ft. motor tender. Ample room to install an auxiliary motor if desired and keel has been bored for this purpose when boat was built. Fast, able and seaworthy. Cost about $17,000, and is altogether the best built, best arranged and most completely equipped boat of her size and type on the coast. Inspectable in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14848



8353

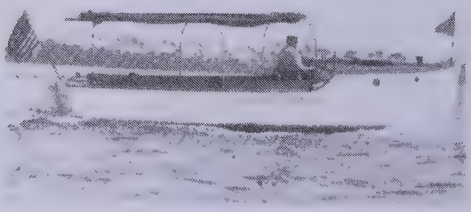
No. 8353—For Sale—Holmes life-boat cruiser. 41 ft. o. a., 9.8 ft. beam, 3.6 ft. draught. Exceptionally heavily constructed—double planked. This motor boat can't sink or capsize and will stand the most severe weather. Holmes life-boat engine in water-tight cockpit aft. This cruiser modeled after 35-ft. Government life-boats and built by the Holmes Motor Company, who have built the best boats made for the Government. Fine galley and toilet. Sleeping accommodations for eight. Mahogany finished cabin. Speed about 10 miles. Fully furnished, including sails—auxiliary to engine. This is the best of the five similar boats built by the above company, making her absolutely the most able motor boat on the Atlantic seacoast. Boat is better than new in 1915. Would cost considerably more to duplicate today than she can be bought for. Price $6,000. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 18457—For Sale—26-ft. motor boat, 10 ft. beam, 2 ft. 6 in. draught. Designed and built by Irving W. Reed, at East Boothbay, Me., in 1910. Equipped with a 24-h.p., four-cylinder, four-cycle, 1914 Pearl engine. 14-ft. cockpit with adjustable brass bow khaki awning over it. Cabin has 5 ft. 6 in. headroom and toilet. Very strongly constructed and has cruised to Florida and return. Completely equipped, including a power skiff, 10 ft. by 4 ft., with a 3-h.p. Eagle engine. Price for this outfit $1,000. Can be inspected near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14861—For Sale—Auxiliary centerboard sloop, 39 ft. 2 in. o. a., 24 ft. w. l., 12 ft. beam and 3 ft. 6 in. draught. Designed and built by H. Manley Crosby at Osterville, Mass., in 1905. 3,000 lb of outside ballast on keel with centerboard passing through it. Very roomy cabin with 5 ft. 6 in. headroom and two wide transoms. Small stateroom on the starboard side with dresser. Ample room forward for one man. Bishop w.c. and folding lavatory. New suit of sails in 1916, 950 sq. ft. in area; also another suit in good condition. New cushions in cabin. 1916, 5-h.p. Mianus motor under cockpit. Lawley hollow spars. Handsome mahogany wheel with the boat's name on it. An ideal yacht for cruising in moderate draught waters. Very stiff, able and comfortable. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



18457



14861



6832

No. 6832—For Sale—Immediate sale is desired of this fine Lawley coast cruising steam yacht. 127 ft. o. a., 16.6 ft. beam, 7.4 ft. draught. Designed and built by George Lawley & Son Corp., 1901. Three staterooms and saloon, besides bath. Beautifully finished and elegantly furnished. 500-h.p. Lawley triple-expansion engine. Almy water-tube boiler, new 1912. Speed up to 14 knots. All modern conveniences and economically maintained. Low price. For further details apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14853—For Sale—Very attractive 60-ft. steam yacht, 11 ft. beam, 3.10 in. draught. Designed by B. B. Crowninshield and built by Rice Brothers at East Boothbay, Me., in 1902. 17 tons gross; 5 tons net. Equipped with a 1912, 75-h.p. Seabury engine, 6x13x8. Orr & Jennings water-tube boiler. Electric lights throughout. Roomy cabin and comfortable stateroom. Mahogany finished inside and out. Fine pilothouse with plate glass windows and brass fittings. Controls from bridge deck or pilothouse. Comfortable cockpit aft with ample space for several wicker deck chairs. Completely equipped for cruising. An ideal boat for afternoon sailing or cruising. Economical to run, able and seaworthy and in perfect condition. Inspectable in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14853

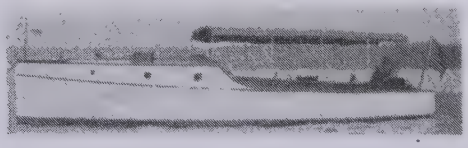


8542

No. 8542—For Sale—Ideal all-year cruiser. 62 ft. o. a., 13 ft. beam, 3 ft. 6 in. draught. Sleeps six. Mahogany finish. Fine light and ventilation. 25-h.p. Standard engine; speed 9 miles. Fully furnished. Owner very anxious to sell. Will consider any reasonable offer. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14743—For Sale—Caprice, 32x6.6x2.10 ft. Sterling, four-cylinder engine, 25-40-h.p.; speed, 14 miles; electric lights; running water; toilet; mahogany trim. New June, 1913. Completely



14743

equipped, in first-class condition. High-grade boat. At Jacobs's Yard, City Island, New York City. David Carll, 180 Elm Street, New Rochelle, N. Y.

* * *

No. 14865—For Sale—Auxiliary single-hander, 37 ft. o. a., 23 ft. w. l., 9 ft. beam and 5 ft. 6 in. draught. Built by F. F. Pendleton at Wiscasset, Me., in 1905. Extremely well constructed and beautifully finished inside and out. White pine



14865



11957

strip deck, mahogany trimmings throughout. Cabin has 5 ft. 7 in. headroom, and is very artistically finished in paneled white and mahogany. Two extension transoms. Sideboard and wine locker with leaded glass windows and full-length clothes lockers. Equipped with a 6-h.p. Lathrop motor, 1916, located forward of cabin bulkhead, separated from cabin. Ratsey sails, practically new, and in good condition. Fully equipped, with toilet, lavatory, stoves, ice-chest, two copper water tanks, lights, etc. Cost to build about $3,000. Sacrifice price of $1,000 takes her. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 11957—For Sale—One of the best auxiliary yawls available. 47.6 ft. o. a., 32 ft. w. l., 12 ft. beam, 5.6 ft. draught. Designed by Crowninshield. Stateroom and saloon. Large galley. Two berths for crew. Can be handled with one paid hand. 12-h.p. engine, gives speed of 5 miles per hour. Fully furnished, including two tenders. Everything in the finest of shape. Low price. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14744—For Sale—Sloop Moose, 35x27x9.6x5 ft., outside iron ballast. 7½-h.p. Mianus motor, giving speed of about 6 miles, cabin finished in bird's-eye maple, sleeps four, good headroom. Galley with toilet, running water, and ice-chest. Bronze steering gear, mahogany wheel, narrow-laid decks, balloon jib, spinnaker, lanterns, anchors, etc. Halyards and sheets lead to cockpit. One man can handle with very little help. Fine outside cruiser, strongly built, and in good condition. Inspection at Bristol, R. I. Price $850. Address W. A. M., P. O. Box 142, Barrington, R. I.



14744



14863

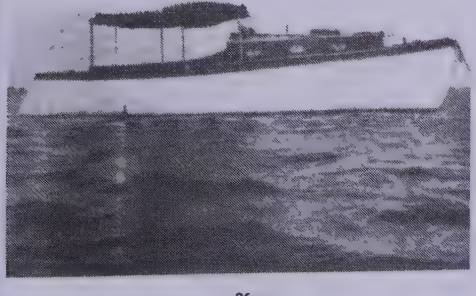
No. 14863—For Sale—Auxiliary cruising yawl, 55 ft. o. a., 36 ft. w. l., 13 ft. 11 in. beam and 8 ft. draught. Gross tonnage, 21; net tonnage, 18. Designed by Small Brothers and built by Rice Brothers at East Boothbay, Me., in 1905. Unusual amount of room below deck which is arranged to the best advantage. Main cabin is very large with two berths on the starboard side and one on the port side. Wide transoms and an abundance of locker room. Spacious stateroom on the starboard side. The galley is large and well equipped, and in it is located the motor, a 12-h.p. Standard, 6x8, which drives her over 7 miles an hour. Sail area 1,800 sq. ft. 8 tons outside ballast. Main saloon finished in mahogany and white enamel. Stateroom finished in mahogany and butternut. Shipmate range with all cooking utensils, sink, pump, ice-chest, etc. Two toilets, one aft and one forward. Fully equipped for sleeping six people aft and two forward. American ship windlass, anchor, davits and falls. This yawl is very easy to handle and is extremely stiff and able. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14864—For Sale—35-ft. motor cruiser, 9 ft. beam, roomy cabin with 6 ft. 2 in. headroom. 22-h.p. Bridgeport motor. Toilet on starboard side aft, galley opposite. Motor in cockpit under cover. Always used as a family pleasure boat and in perfect condition. Cushions, new awnings, two oil stoves, large ice-chest, power whistle with compressed air. Very heavily constructed and a fine, able sea-boat. Roomy cockpit, one-man control, new extra size Joe reverse gear. May be seen at Falmouth, Mass. Bargain price of $1,000 as owner's son is going to France and the boat will not be used the coming Summer. Application for an inspection to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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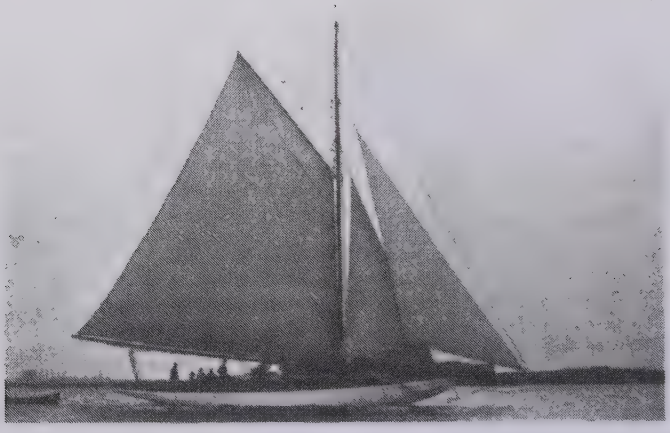
No. 14866—For Sale—Very attractive, 30-ft. cabin motor boat. Built in 1913. 8 ft. beam, 25-h.p. Frisbie 1915 motor, giving a speed of 10 miles an hour. Cabin is 17 ft. long and has 5 ft. 10 in. headroom. Two wide transoms, toilet, lavatory, spacious lockers, skylight, etc. Owner and wife lived on board her last Summer in perfect comfort. 10-ft. water-tight cockpit. Electric lights, military mast and complete cruising equipment. Perfect control from cockpit. For sale to settle an estate. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14864



14866



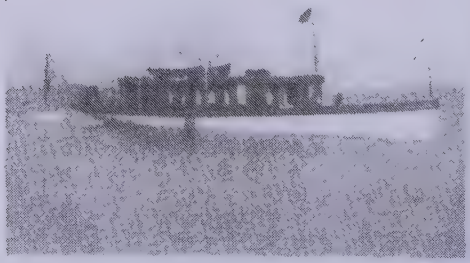
14862

No. 14862—For Sale—Very attractive cruising sloop. Built by George Lawley and Son Corporation, at South Boston, Mass., in 1901, from designs of Crowninshield. 55 ft. 6 in. o. a., 35 ft. 6 in. w. l., 12 ft. 4 in. beam and 8 ft. draught. Gross tonnage 17, net tonnage 15. Sail area, 1,744 sq. ft. 14,000 lb lead ballast on keel. Very best construction with copper fastenings throughout. Roomy cabin handsomely finished in butternut and mahogany, with 6 ft. 1 in. headroom. Comfortable stateroom and spacious forecastle. 10-ft. water-tight cockpit with handsome upright brass binnacle. Cabin is very attractively upholstered and has two skylights which give complete ventilation. Two toilets, one aft, one forward. Two water tanks under transoms with a capacity of 75 gals. each. Very large ice-chest. Tender on davits. Complete set of dishes, fine stove, electric lights, table linen, crockery, etc. This yacht is high-grade in every respect and is one of the best craft ever turned out by Lawley. Bronze fittings, the best grade of blocks throughout, everything of the best. In fine condition inside and out. Price low. May be seen at Marblehead, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

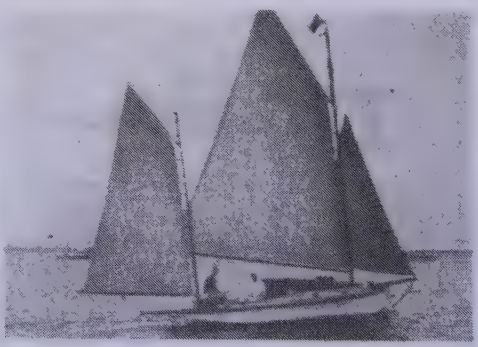
No. 14860—For Sale—66-ft. motor yacht. 12 ft. beam, 3 ft. 5 in. draught. Gross tonnage 33, net tonnage 28. Built by J. C. Wignall, at Philadelphia, in 1900, from designs of F. D. Lawley. Equipped with two 25-h.p., four-cylinder, 6x8, 1906, Standard motors, giving speed of 10 knots. Cabin 38 ft. long with 7 ft. headroom; seven berths. Two toilets. Carries two boats with davits. Well equipped in every respect. A splendid cruising motor yacht. May be seen at Ellsworth, Me., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14748—For Sale—Strongly built Seabird yawl, 30.6 ft. o. a., 10 ft. beam, 2 ft. draught; centerboard. Roomy cabin, with toilet, galley, sink, chest of drawers, corduroy cushions, cruising equipment, and tender. 5-h.p. Bridgeport engine in perfect running order. Boat built to order in Solomon Islands in 1912; engine added in 1915. Will need new sails soon on account of mildew, otherwise perfect. New life-buoy cushions in cockpit. Bottom price, $500. Can be seen at Morton Johnson's, Bay Head, N. J. Address Box 100, Care of The Rudder Publishing Company, 254 West 34th Street, New York City.



14860



14748



8429

No. 8429—For Sale—High-grade coast cruiser. 50 ft. o. a., 11 ft. beam, 3.6 ft. draught. Designed and built by Matthews Boat Company, 1914. Two staterooms, each with two spring berths. Toilet room with small tub. White enamel and mahogany finish. Separate quarters and w.c. for crew. 50-85-h.p., six-cylinder Sterling, installed 1916; speed 10 knots per hour. Complete inventory. An exceedingly attractive and exceptionally able cruiser. Can be run with one paid hand. Low price for immediate sale. Apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14746—For Sale or Charter—The Danascara. Big bargain for first reasonable offer as owner wants larger boat. Seawanhaka one-design, 33x21x7.8x4.6 ft. cabin sloop, ballast 3,600 lb on keel. New jib and mainsail 1916. Sail area, 550 sq. ft. Storm jib and No. 2 jib. Pantasote-covered spring cushions, heavy woolen blankets, Pullman hammocks, cushions, tool box, three anchors and ropes, spirit compass, canvassed decks. Inspectable George J. Stelz' Boat Yard, College Point, L. I. Boat has cruised between New York and Massachusetts coast each Summer for last few years. Fast and able, handled with greatest ease. Address David Moffat Myers, 110 West 40th Street, New York City.

* * *

No. 14751—For Sale—Cruiser Narmada, 91 ft. by 10 ft. beam, flush deck type. Twin-screw, six-cylinder Scripps motors, 7½x9 in. Maximum speed 15 miles, cruising speed 14 miles. Completely fitted out for service with accommodations for seven guests. Exceptionally strong construction. Lighted throughout by 110-volt storage battery. (New) 15-k.w. generator directly connected to four-cylinder, 7½x9 in. Scripps motor. Three mahogany tenders included with equipment, one of which is convertible into an electric launch. Will sell for one-third of original cost. Write for full details. W. E. Scripps, Detroit, Mich.



14746



14751

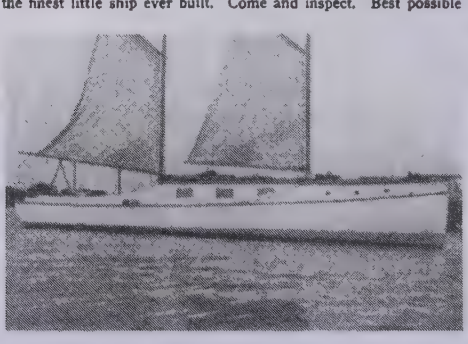


8532

No. 8532—For Sale—Elco-de-Luxe express day cruiser, 54 ft. o. a., 9 ft. beam, 3 ft. draught. Designed and built by the Elco Company, 1914, at cost of $12,000. Owner's saloon with two comfortable berths, toilet and galley. Finished in mahogany. Two berths and w.c. for crew forward. Finest construction. 60-h.p. Standard engine; speed 15 miles. Ideal as gentleman's yacht for ferry service or tender to large sailing yacht. Apply to Stanley M. Seaman, 220 Broadway, New York City.

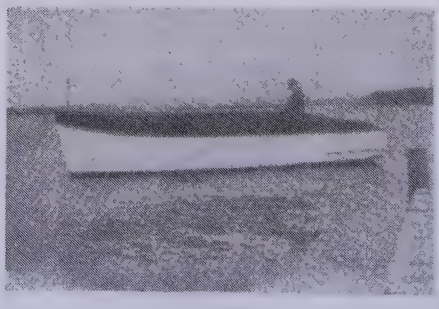
* * *

No. 14745—For Sale—An ideal cruiser. Honestly believe her the finest little ship ever built. Come and inspect. Best possible



14745

construction. Keel, stem, sternpost, frames, all finest S. I. white oak; planking, 1¼ in. cedar below, selected pine above.



14858



8291

33x8.2x3 ft. Two separate cabins. Party of four lived aboard in perfect comfort over six months' cruise South. Ideal practical rig. Saves gasolene bills. Ran engine from New York to Miami on 230 gals. gasolene. Three years old. Well found, every respect. A sailor's boat all over. Eagle engine—speed 7½ miles. Price $800. Take good 40-ft. sloop in exchange. Capt. W. Pearson, Great Kills, Staten Island, N. Y.

* * *

No. 14858—For Sale—26-ft. cabin motor boat, 7 ft. beam. Built by W. B. Rose at Wakefield, R. I., in 1914. 16-h.p., 2-cylinder Scripps 1914 motor, giving her a speed of 11 miles an hour. Cabin about two-thirds length, with 5 ft. 4 in. headroom, entered in center and divided in three parts and is completely equipped for cruising. Cushions, curtains, ice-chest, toilet, wash basin, self-bailing cockpit and one-man control. To duplicate this boat would cost over $1,500 and is now offered at the bargain price of $900. Can be seen at Wakefield, R. I., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 8291—For Sale—Able coast cruiser. 70 ft. o. a., 12 ft. beam, 4 ft. draught. Large stateroom and saloon. Mahogany finish. 50-h.p. 20th Century engine; speed 12 miles. Fully furnished and always kept up. Offer solicited. Apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 8504—For Sale—Exceptionally able trunk cabin cruiser with auxiliary ketch rig. 34 ft. o. a., 10 ft. beam, 3.6 ft. draught. Cabin berths four people. Headroom 6.2 ft. Toilet, galley, 20-h.p., four-cycle Buffalo motor. Electric lights. Fully furnished and in first-class condition. Low price. Apply to Stanley M. Seaman, 220 Broadway, New York City.



8504



8557

No. 8557—For Sale—Twin-screw gasolene coast cruiser. 90 ft. o. a., 14.6 ft. beam, 3.6 ft. draught. Three staterooms and saloon. Bath and extra toilet for owner and guests. Finished in mahogany. Deck dining saloon. Unusually well constructed. Built by the N. Y. Yacht, Launch & Engine Company, and fitted with two of their 40-h.p., 20th Century motors; speed 11 miles per hour. Thoroughly overhauled inside and out and furnishings practically renewed 1916. Offer solicited. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 5915—For Sale—Exceptionally fine twin-screw seagoing gasolene yacht. 90 ft. o. a., 14 ft. beam, 5 ft. draught. Designed by Wm. Gardner, built by James M. Bayles & Son, 1907, at Port Jefferson, L. I. Extra heavy construction—double planking, mahogany deck trim. Three staterooms, bath and two toilets for owner and guests. Finished in solid mahogany. 7 ft. headroom. Two 60-h.p. Craig engines; speed 12 to 14 miles per hour. Fully furnished for cruising. In first-class condition, having been hauled out every Winter. Provides practically houseboat accommodations with excellent speed. Economically maintained. Crew, five. Very low price for immediate sale. Inspectable Toledo, O. For further details address Stanley M. Seaman, 220 Broadway, New York City.



5915



12162

No. 12162—For Sale—Keel cruising schooner. 62 ft. o. a., 42 ft. w. l., 14 ft. beam, 8.3 ft. draught. Built 1905. Two staterooms and saloon berth six people. Two toilets. Large galley. Mahogany interior. Unusually well equipped, including two tenders and two suits Wilson & Silsby sails, one new 1916. Exceptionally able and consistent cruiser. Low price. Address Stanley M. Seaman, 220 Broadway, New York City.

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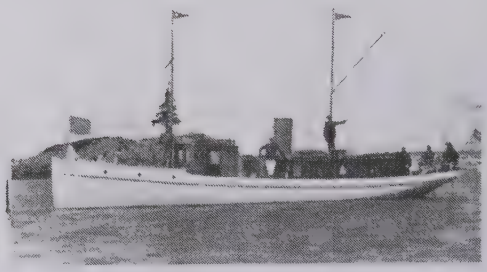
No. 14739—For Sale at a Bargain—The safest, most comfortable and economical cruiser of her size on the coast, 53x11x4½; Standard engine, speed 12 miles; steering wheel and engine control in pilothouse, which contains spring berth. Can be handled by one man. Mahogany houses and finish. Large galley with coal range, sink, lockers and ice-chest; two pipe berths. Cabin with four spring berths, toilet, etc. Electric lights throughout boat, searchlight, dynamo and storage battery. This boat is in perfect condition; engine new 1916. May be seen at Coombs's Boat Yard, Belfast, Me. E. D. Tapley, M. D., Belfast, Me.

* * *

No. 8501—For Sale—This very desirable houseboat is offered for immediate sale to close estate. 49 ft. o. a., 16 ft. beam, 3.8 ft. draught. Built 1913 of heavy construction. 25-h.p. Globe engine. Fully furnished, including launch and dinghy in davits. Offer solicited. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14209—For Sale—Well-known sloop yacht Tyro. Champion in her class of Massachusetts Bay; 38 ft. o. a., 22 ft. w. l., 10 ft. beam, 6 ft. 11 in. draught. Built in 1905 by Hodgdon Bros., at East Boothbay. From design of Crowninshield. Mahogany planked and finished bright. Fine cabin and roomy, watertight cockpit. Two suits of sails, one suit new this year. Complete



14739

equipment, including bright cedar tender. Ideal boat for cruising, day sailing or racing, and can easily be handled without a paid man. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14749

No. 14749—For Sale—Centerboard sloop yacht, 44x32.6x13.2x4.2 ft. Built by Jacobs. Ratsey sails; two staterooms; fully and nicely furnished and equipped for cruising. Fast and very able. Everything in good condition, and price very moderate. Address Frank G. Day, 87 Milk Street, Boston, Mass.



14209



8501



8147

No. 8147—For Sale—Twin-screw express cruiser. 50 ft. o. a., 9 ft. beam, 3 ft. draught. Built 1912. Two 35-50-h.p. Van Blerck engines, each fitted with taxi-meter on bridge. Speed 15 knots per hour. Thoroughly overhauled Summer 1916. Cabin berths three people. Headroom 6.2 ft. Fully furnished and only offered as owner has larger boat. Low price for immediate sale. Address Stanley M. Seaman, 220 Broadway, New York City.

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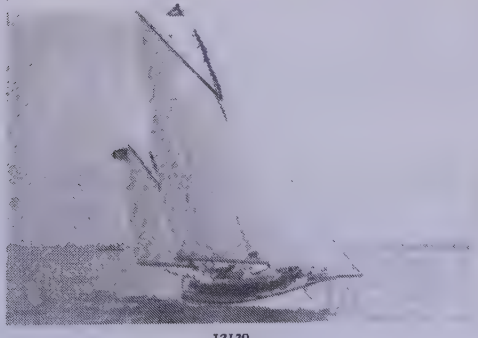
No. 12139—For Sale—Keel cruising yawl. 31 ft. o. a., 25 ft. w. l., 10 ft. beam, 5 ft. draught. Extra heavy construction throughout. Designed by Crowninshield. Built 1909. Two transoms in cabin sleep four people. Headroom, 6 ft.; toilet room. Fully furnished. Boat sound and in first-class condition. Able and comfortable cruiser. Easily handled. Room in cockpit for auxiliary engine. Apply to Stanley M. Seaman, 220 Broadway, New York City.

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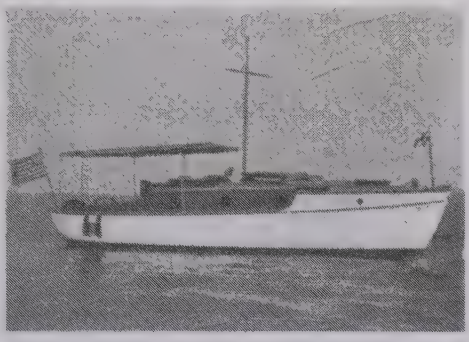
No. 14855—For Sale—34-ft. cabin motor boat, 9 ft. beam. Built by George B. Loring, at Braintree, Mass., from designs of John Small. Equipped with a 20-35-h.p., four-cylinder Sterling motor. Roomy cabin with 5 ft. 10 in. headroom. Water-tight cockpit. Very complete equipment, including tender, cushions, military mast, lights, flags, awnings, etc. Very attractive in appearance, able and seaworthy. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 8342—For Sale—One of the handsomest 32-ft. cruising launches available. 8.6 ft. beam, 2.6 ft. draught. Built 1913. Mahogany cabin with 6 ft. headroom and two comfortable berths. Toilet. 15-h.p., four-cycle engine; speed 9½ miles per hour. Fully found and whole outfit good as new. Apply to Stanley M. Seaman, 220 Broadway, New York City.

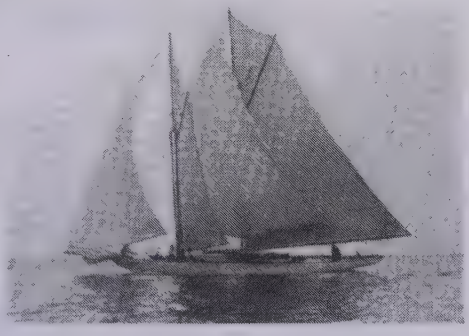


12139



14855

No. 12124—For Sale—This handsome modern Lawley flush deck auxiliary keel seagoing schooner yacht is offered at a very low price. 92 ft. o. a., 60 ft. w. l., 19 ft. beam, 9.6 ft. draught. Exceptionally well constructed—winner Bermuda Race, 1909. Two double staterooms and saloon. Bathroom. New 60-h.p.

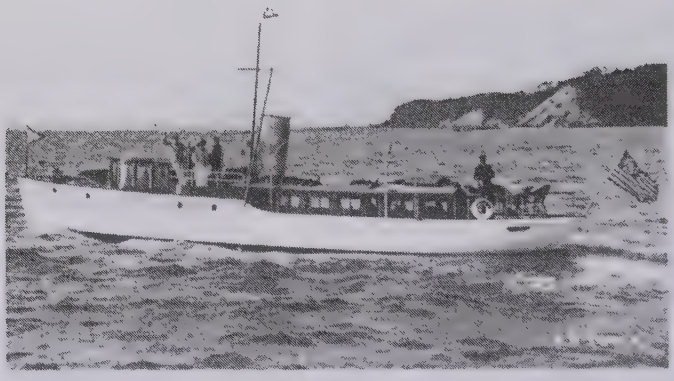


12124

Lamb engine, gives speed of 9½ miles per hour. Fully furnished, including two tenders—launch. New Ratsey sails 1916 as well as interior furnishings. Offer solicited. Apply to Stanley M. Seaman, 220 Broadway, New York City.



8342



8477

No. 8477—For Sale—Handsome bridge deck motor yacht. 62.6 ft. o. a., 12.2 ft. beam, 3.9 ft. draught. Deck dining saloon. Double stateroom with two berths and saloon with two Pullman berths accommodate six people. Heavily constructed. Designed and built by Murray & Tregurtha Company, 1912. Equipped with one of their 40-60-h.p. engines, giving speed of 12 miles per hour. Fully furnished, including two tenders in davits. All upholstery, carpets, bedding, etc., new 1916. Having deck control she can be maintained with captain and cook. Whole outfit in first-class condition. Inspectable New York City. Apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14850—For Sale—Fast 35-ft. cabin motor boat. Designed and built by Edward Heintz, at North Attleboro, Mass., in 1913. Equipped with a 16-h.p., four-cylinder, four-cycle Scripps motor giving her an average speed of 14 miles an hour. Roomy cabin, finished in bright paneled oak with 5 ft. 6 in. headroom. Motor is located forward under raised deck with steering cockpit forward of motor. Square hatch opening forward of motor. Companionway slide over motor. Toilet on starboard side. Large ice-chest on port side. Roomy cabin with extension berth on each side. Spacious clothes lockers aft. Funnel over cabin top with water-tank inside. Electric lights. Water-tight cockpit with companionway entering cabin. Steering wheel aft as well as in forward cockpit, both separately connected with rudder. Completely equipped in every respect. Cushions, lights, anchors and cables, dishes, stove, military mast, awning, etc. This is a very well built boat and an attractive looking craft and is faster than most 35-ft. cruising motor boats. Price $1,500. May be seen near New Bedford, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14850



12032

No. 12032—For Sale—This handsome keel cruising sloop is offered at low price for immediate sale. 38 ft. o. a., 28 ft. w. l., 8.10 ft. beam, 6.8 ft. draught. Lead keel; fine mahogany cabin; berths three people; 6-ft. headroom; separate toilet; large galley; berth in foc'sle. Full cruising inventory, including 10-ft. tender. Very able cruiser. In good condition. Offer solicited. Apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14747—For Sale—Cabin cruiser, nearly new, 33x8 ft. planking white cedar, cabin mahogany, self-bailing cockpit, lavatory, ice-box, sleeping accommodations for four. Model B, 25-40-h.p. Sterling engine. Everything in A-1 condition. Can be seen at Johnston's Boat House, Bemus Point, Chautauqua Lake, N. Y. At less than half price—$1,500. A. C. Canfield, Penn. Avenue and 30th Street, Pittsburgh, Pa.

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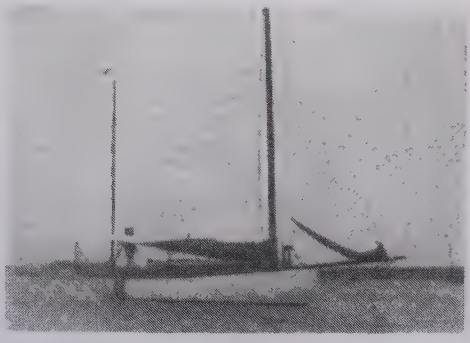
No. 12131—For Sale—Exceptionally able single-handed C/B auxiliary cruising yawl. 35 ft. o. a., 30 ft. w. l., 12 ft. beam, 3.8 ft. draught. 6.2 ft. headroom. Cabin berths four. 10-h.p. Sterling engine, new 1914; speed 7 miles. Fully furnished, including tender. New sails. Boat is sound. Very able and smart sailer. Low price for immediate sale. Apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 8025—For Sale—This able seagoing gasolene cruising yacht is offered at a low price for immediate sale. 65 ft. o. a., 12.6 ft. beam, 3.6 ft. draught. Two staterooms and saloon, latter used as dining room. Mahogany finish. Bathroom with all conveniences. 100-h.p., six-cylinder Standard engine; speed 13 miles per hour. Completely furnished for cruising. Offer wanted. Address Stanley M. Seaman, 220 Broadway, N. Y. City.



14747



12131

No. 8133—For Sale—The finest cruiser of size and type available. 55 ft. o. a., 11 ft. beam, 3.9 ft. draught. Built 1912, by Britt Brothers, from Swasey's design. Double stateroom and saloon with two Pullman berths. Galley full width. 40-h.p.



8133

Murray & Tregurtha engine; speed 11 miles. Electric lights. Condition guaranteed to be absolutely first-class throughout. Price low. Stanley M. Seaman, 220 Broadway, New York City.



8025



14845

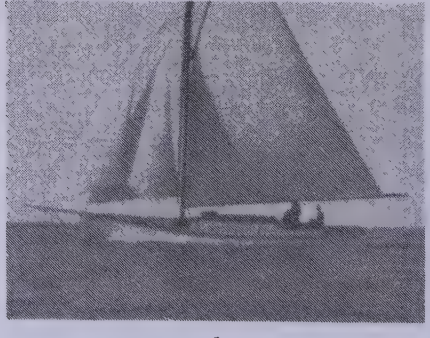
No. 14845—For Sale—45-ft. motor cruiser, 10 ft. beam, 3 ft. 6 in. draught. Built by James E. Graves at Marblehead, Mass., in 1911 from the designs of Samuel Brown. Equipped with a 30-40-h.p., four-cylinder, four-cycle Murray & Tregurtha engine which gives her a speed of over 10 miles per hour. Electric lighted. 100 gasolene tanks under cockpit seats. Cabin forward of engine with full headroom. Crew's quarters in engine room. Controls from bridge seat forward as well as aft. Strongly constructed with long pine planking. Completely equipped to conform with the Government regulations. Five anchors with chains and cables. 11-ft. Murray & Tregurtha tender. 40-gal. water tank. Toilet and lavatory. Fine cushions, etc. This attractive craft can be inspected at Marblehead, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14859—For Sale—Cruising sloop yacht, 37 ft. o. a., 24 ft. 6 in. w. l., 9 ft. 8 in. beam, 6 ft. draught. Extra heavy built, in 1901, for cruising. Good sailer and a very able sea-boat. Uncapsizable, having 4,260 lb iron on keel and about 500 lb iron inside ballast. Spacious cabin, 12 ft. 4 in. long, about 5 ft. 3 in. headroom; toilet, compass, two anchors, two cables, cushions, dishes. This yacht has had but little use and is in fine condition. Bargain price of $350. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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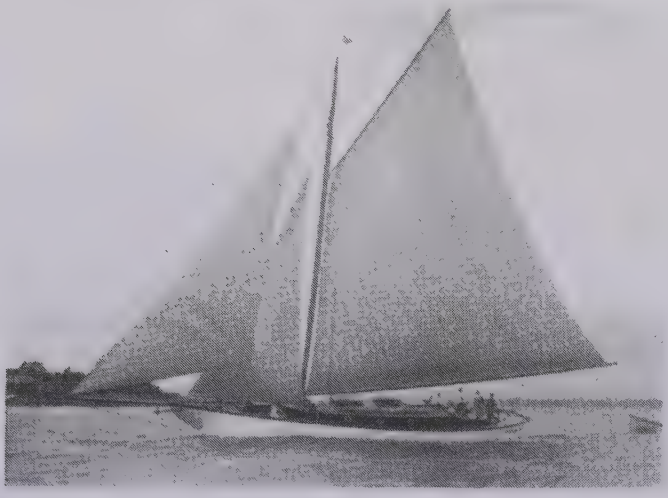
No. 14847—For Sale—Keel cruising sloop, 57 ft. o. a., 41 ft. 6 in. w. l., 14 ft. 5 in. beam and 8 ft. draught. Net tonnage, 14.22. Roomy cabin with two staterooms finished in paneled mahogany. Very attractive in appearance and extremely stiff and able. Five tons outside ballast. 8-ft. water-tight cockpit. Two toilets, one aft and one forward. Very complete cruising equipment. 150-gal. water tank, lights, cushions, flags, etc. May be seen near New York by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14859



14847



14870

No. 14870—For Sale—Or can be chartered for the Summer on very reasonable terms. 37 ft. w. l. auxiliary sloop, 53 ft. o. a., 14 ft. beam, 8 ft. 6 in. draught. Very strongly constructed in 1906 by Charles F. Brown at Pulpit Harbor, Me. 8,000 lb of lead on keel. Very comfortable cabin finished in mahogany throughout, with 6 ft. 3 in. headroom. Roomy stateroom on starboard side. Wide berths in cabin as well as transoms. 15-18-h.p. Lozier two-cylinder motor, giving speed of 7½ miles an hour. Handsome white pine strip deck. Two mahogany skylights over cabin. Opening brass ports on each side of cabin house. An ideal yacht on which to spend the Summer, as her cabin accommodations are unusually comfortable. Spacious forecastle with galley. Shipmate range, large ice-chest, dish locker. Berth forward for a man. Complete equipment including tender on davits, cushions, lights, flags, etc. Best of rigging, sails and blocks. Exceptional opportunity to purchase a fine yacht at a reasonable figure or to charter for the Summer if preferred. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14872—For Sale—One of the well-known Boston Y. C. one-design class 15-foot knockabouts. Built by T. L. White, at Manchester, Mass., in 1907, from designs of Small Brothers. 24 ft. o. a., 15 ft. w. l., 6 ft. 6 in. beam, 3 ft. 10 in. draught. 500 lb ballast on keel. Roomy cockpit. Room under deck forward to stow sails. Sail area 285 sq. ft. Easy to handle, absolutely uncapsizable, and very stiff. Splendid boat for a boy or girl to learn sailing. Bargain price $250. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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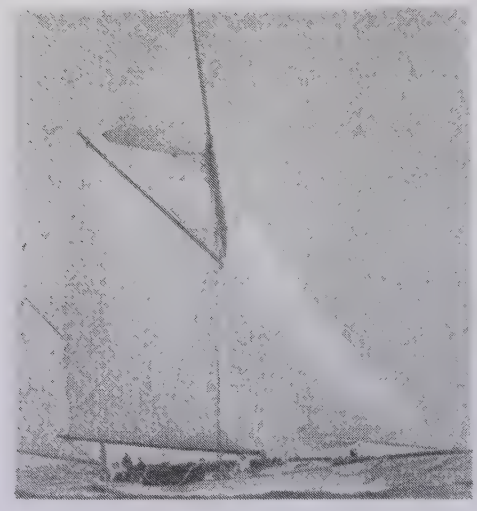
No. 14757—For Sale—Bargain: Able topsail sloop, 43.8x30x12.4x7.3 ft., fine cruiser, easily handled, economically maintained, fast to windward. Heavy construction, white oak frames, long-leaf planking, galvanized fastenings, Ferris design, Rice Bros. build, 5¾ tons iron keel, 85-gal. water and 27-gal. gasolene tanks, wide decks, mahogany trim, cypress interior, new running rigging, self-bailing cockpit. Crew's berth, four in cabin, two transoms, full headroom, hanging and other lockers, toilet room, lavatory, stoves, refrigerator, 15-h.p., two-cylinder motor, folding propeller, large equipment. In good condition. Inspectable near Boston. Price low. Apply to brokers.



14872



14757



14867

No. 14867—For Sale—Auxiliary yawl, 71 ft. o. a., 45 ft. w. l., 15 ft. 2 in. beam, and 8 ft. draught. Gross and net tonnage 32. Very well constructed, with white oak frames and Oregon pine and long-leaf hard pine planking. 13 tons of lead on keel. 18-24-h.p. Standard motor in perfect condition, driving her 7 miles an hour. Very roomy and attractive cabin, finished in white enamel with about 7 ft. headroom. Owner's double stateroom aft. Toilet easily accessible from either cabin or owner's stateroom. Single stateroom on forward starboard side of cabin. Sails new in 1915. Flush deck in perfect condition, practically new. Large circular cockpit with brass binnacle. Very complete cruising equipment, which includes a 16-ft. Lawley launch, cedar and mahogany, with a 7-h.p. Eagle motor, Paragon reverse gear, etc. Also a new 13-ft. dinghy. Two 160-lb anchors with cables. Electric lights, silver, glass and crockeryware. Shipmate range and cooking utensils, engine tools, etc. This very fine yacht may be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14758—For Sale—Clara, Hanley's latest, best and fastest catboat; 26 ft. o. a., 12 ft. 3 in. beam, 2 ft. 6 in. draught.



8339

Absolutely sound. Splendid cabin for six. Hair cushions, plush covered. Full inventory for racing or cruising. Price, $600. H. W. Robbins, 412 Front Street, Weymouth, Mass.

* * *

No. 8339—For Sale—Seagoing gasolene cruiser, 52 ft. o. a., 11.6 ft. beam, 3.2 ft. draught. Designed and built by N. Y. Yacht, Launch & Engine Company, 1912. Double stateroom aft and saloon with two upholstered transom berths. Large toilet room with tub, w.c. and w.b. Owner's quarters finished in mahogany—elaborately panelled. Two berths and w.c. for crew. Can be run with one paid hand. 50-h.p. 20th Century engine; speed over 10 miles per hour. Electric lights. New 200-ampere-hour batteries. Whole outfit in perfect condition. Attractive price. Address Stanley M. Seaman, 220 Broadway, N. Y. City.

* * *

No. 14883—For Sale—Very attractive motor runabout. 25 ft. 2 in. long, 5 ft. 2 in. beam, 2 ft. draught. Speed 18 miles an hour. This boat has a 25-35-h.p. Sterling, four-cylinder motor which was completely overhauled during the last season and every part which showed the slightest wear was replaced. The boat was not used to any extent whatever during the past season and was not run more than a couple of hundred miles. Newly painted before laying up and various valuable additions were made to her equipment. Built in 1913 by Andrew Wheeler, at Gloucester, Mass., from designs of S. H. Brown. Motor under deck forward. 10-ft. cockpit covered with McClellan automobile top. Safety rear starter. Bosch magneto and Bosch plugs. Reverse gear, electric horn, automobile wheel with controls. Bargain price $750. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14758



14883



14219

No. 14219—For Sale—Auxiliary cruising sloop, 51 ft. o. a., 32 ft. w. l., 13 ft. 11 in. beam, 7 ft. 4 in. draught, 11 gross tonnage. Built by George Lawley & Son Corporation, in 1901, from designs of Crowninshield. 10-12-h.p., 1912 Fulton motor, giving speed of 6 knots under power alone. Constructed in the usual high-grade Lawley manner. 5 tons of lead on keel. One of the best arranged and most elaborately finished craft of her size and type ever constructed. Unusually large cabin, 6 ft. 2 in. headroom, with two spacious closets, two fixed berths with wide transoms in front, sideboard at forward end, all finished in panelled mahogany. Forward on starboard side large toilet room 6 ft. long. 6-ft. galley with stove space, ice-chest, etc. Berths for two men forward, toilet, etc. Sails in perfect condition; completely equipped in every respect. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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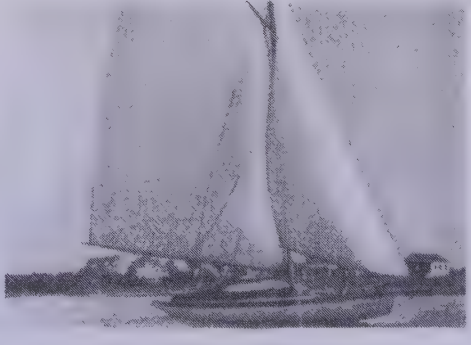
No. 14879—For Sale—Very handsome 28-ft. w. l. keel cruising sloop. 42 ft. 9 in. o. a., 9 ft. 2 in. beam, 6 ft. 6 in. draught. Absolutely tight. Finished in solid mahogany throughout. 6 ft. 2 in. headroom in cabin and galley. Two long extension transoms and two folding berths. Sleeps six in cabin. Watertight cockpit. Toilet and set wash-bowl. Very best of construction. Southern hard pine planking, copper fastenings, oak frames. Berth forward for a man. The best of spars, rigging, and blocks. 40-gal. water tank. Complete cruising equipment, including green velour cushions, electric lights and bells, ice-chest, full set of dishes and cooking utensils, two awnings and mahogany table. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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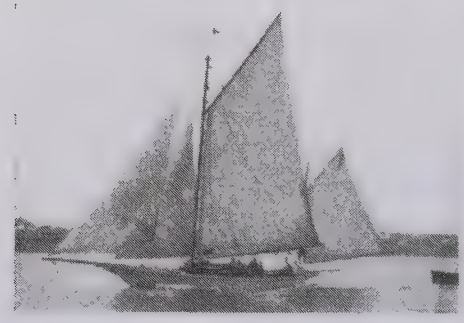
No. 14878—For Sale—Crack 18-ft. w. l., centerboard sloop. Designed and built by George W. Shiverick at Kingston, Mass., in 1907. 30 ft. 10 in. o. a., 7 ft. 6 in. beam and 2 ft. 9 in. draught. Built for the Massachusetts Yacht Racing Association 18-ft. Knockabout Class. Very fast and has won championship of the Duxbury Yacht Club 18-ft. class. Nice little cabin and watertight cockpit. A splendid boat for a boy or girl to learn to sail in as she is very safe. This boat has always been well kept up and is in good condition. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14879



14878

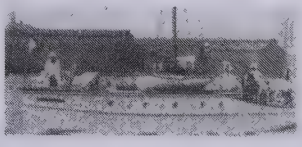


14873

No. 14873—For Sale—Lawley-built auxiliary cruising yawl. 38 ft. 6 in. o. a., 27 ft. w. l., 9 ft. 6 in. beam, 6 ft. draught. Flush deck with raised companionway and skylight. Full headroom. Sleeps four in cabin and one forward. Folding berth on each side and transom. Mahogany finish. New toilet and Sands' lavatory. 6-h.p. Lathrop motor under cockpit. Very complete equipment, including tender, electric lights throughout, cushions, stove, dishes, etc. A perfect single-hander. Splendid sea-boat. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 4441—For Sale—Speedy raised deck cruiser, 44.10 ft. o. a., 11 ft. beam, 3.4 ft. draught. Has made exceptional racing record. Four-cycle, 30-h.p. Sterling engine. Rushmore starter.

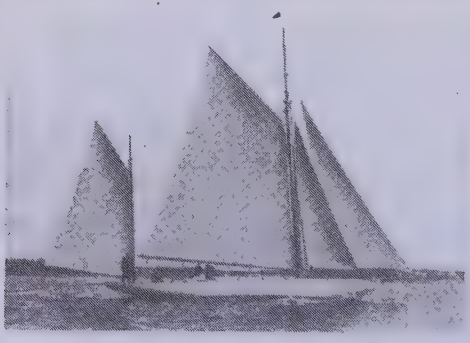


4441

12-volt storage battery. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

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No. 14875—For Sale—35-ft. w. l. auxiliary cruising yawl, 52 ft. 7 in. o. a., 12 ft. 4 in. beam and 7 ft. 9 in. draught. Designed by Crowninshield and built by Rice Brothers at East Boothbay,



14875



8408

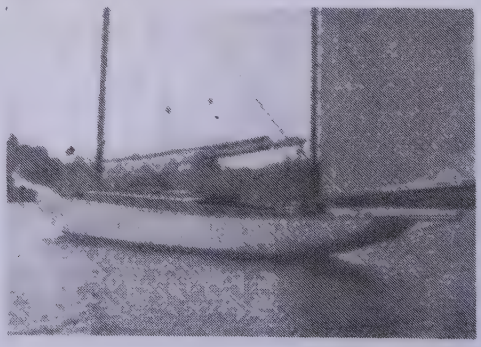
Me. Equipped with a 14-h.p. Fairbanks 1915 motor under cockpit floor. Finest construction throughout. Roomy watertight cockpit. Large cabin and stateroom, sleeping five persons comfortably. Interior finish mahogany and white enamel. Headroom 6 ft. 1 in. Two toilets, new 1916. Two suits of sails, one suit new 1916 made by Wilson & Silsby. Two pipe berths forward. Carries two boats, one a power tender. 100-gal. water tank. 12,000 lb outside ballast. Steers perfectly and is an extremely easy craft to handle. Mahogany deck trimmings, the best plow-steel rigging, bronze fittings, etc. This is an opportunity to purchase a high-grade yacht at a very reasonable price. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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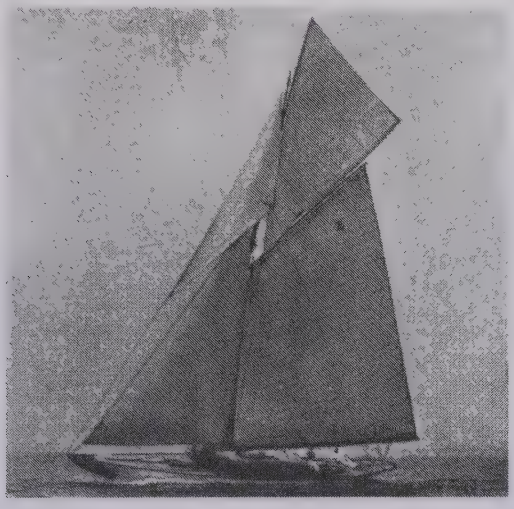
No. 8408—For Sale—One of the well-known "Sea Rover" cruising launches. Built by New York Yacht, Launch & Engine Company in 1910. Large and airy cabin with 6.4 ft. headroom. Finished in mahogany. 24-h.p. 20th Century engine; speed 9½ miles per hour. Fully furnished, including tender. Offered at low price for immediate sale. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14880—For Sale—Auxiliary yawl, 48 ft. o. a., 33 ft. w. l., 11 ft. beam, 6 ft. 6 in. draught. Designed and built by Rufus Condon, at Friendship, Me., in 1913. Very strongly constructed with 6,200 lb outside ballast and 1,600 lb inside ballast. Roomy cabin with full headroom, finished in mahogany. Sleeps eight people. 7-h.p. Bridgeport motor. Complete cruising equipment, including tender, three anchors and cables, cushions, lights, etc. 9-ft. watertight cockpit. Two water tanks, 75 gals. capacity. Easy to handle, stiff, and able. May be seen near Boston, by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14880



14869

No. 14869—For Sale—Fast cruising sloop, 60 ft. o. a., 38 ft. 4 in. w. l., 11 ft. 4 in. beam, 7 ft. 10 in. draught. Built by Robert Jacob, at City Island, N. Y., in 1909 from designs of H. J. Gielow. Gross tonnage 17.08. The very best condition throughout. White oak frames, double planking, mahogany outside, cedar inside, copper fastenings. Narrow mahogany cabin trunk, giving ample deck space. Watertight cockpit. Lead ballast on keel. Roomy cabin, 8 ft. long with 6 ft. 2 in. headroom, furnished in white and mahogany. Two wide transom berths with lockers underneath. Forward on each side is a buffet with sideboard. Owner's stateroom aft, fitted with two single berths and two large wardrobes. Two toilets, galley and forecastle with three berths. Sail area, 1,925 sq. ft. Complete cruising equipment, including two boats, one of which is a motor tender, electric lights, cushions, etc. Easy to handle, fast, stiff and able, a bargain. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14885—For Sale—Attractive 36-ft. cabin cruiser. 9 ft. 6 in. beam, 2 ft. 8 in. draught. Designed and built by George Loring at East Braintree, Mass., in 1912. 23-ft. cabin with 6 ft. headroom. Toilet on port side. 10-ft. watertight cockpit. 25-h.p., four-cylinder, four-cycle motor, giving speed of 9 miles an hour. Very complete equipment, including round-bottom cedar tender, Shipmate range, dishes and cooking utensils, new corduroy cushions stuffed with hair, blankets, phonograph, compass, three anchors and cables. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14874—For Sale—55-ft. motor cruiser, 11 ft. 2 in. beam, and 3 ft. 9 in. draught. Designed and built by Murray & Tregurtha Company at South Boston, Mass., in 1912. Equipped with a 40-50-h.p., four-cylinder, four-cycle Murray & Tregurtha motor, 6½x8, giving a speed of 12 miles per hour. Cabin handsomely finished in mahogany and white. Controls from bridge. Electric lights, motor tender, on davits, military mast, windlass, etc. Complete equipment. A very high-grade boat in every respect. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14885



14874



14876

No. 14876—For Sale—Fast and able 22-footer, designed by Small Brothers, and built by Hodgdon Brothers, at East Boothbay, Me., in 1905. 38 ft. o. a., 22 ft. w. l., 10 ft. beam, 6 ft. 7 in. draught. Very well constructed with copper fastenings, oak frames, etc. Outside lead ballast. Good headroom in her cabin. Cousens & Pratt sails, 900 sq. ft. in area. This is a very fast and comfortable craft and is for sale at a bargain price. Unusual opportunity to purchase a high-grade yacht at a sacrifice. May be seen near Providence, R. I., by applying to Hollis Burgess Yacht Agency, 15 Exchange St., Boston, Mass.

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No. 2995—For Sale—Handsome cruising launch, 51 ft. o. a., 10.9 ft. beam, 2.6 ft. draught. Powered with a Standard engine, giving speed of 11 miles. Electric lights, searchlight. Sleeps



2995

five. Mahogany saloon and stateroom. Well constructed throughout. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.



14756

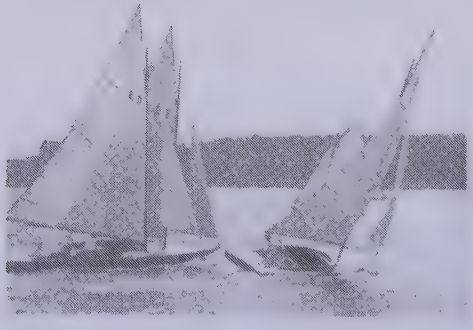
No. 14877—For Sale—One of the well-known Crane one-design class 15-ft. w. l. knockabouts, 25 ft. o. a., 8 ft. beam, 3 ft. 6 in. draught. Built by George Lawley & Son Corporation at Neponset, Mass., in 1912, from designs of Joshua Crane. Mahogany planked and copper fastened. 900 lb outside lead ballast, 300 lb inside lead ballast. Centerboard passing through keel. Sail area 375 sq. ft. Very stiff, fast and able. Splendid boat for boy or girl to learn sailing as she is uncapsizable and perfectly safe. Exceptional bargain. May be seen at Fall River, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14756—For Sale—Combination keel and centerboard knockabout, designed and built by Lawley. Outside ballast, 22x32x8.6x3.6x6.6 ft. With round-bottom light cedar tender. Cabin and cockpit mahogany and teak. Bronze Edson quadrant steering gear. Rosewood, mahogany and brass wheel. Bliss spirit compass, set under glass in cockpit floor. Three anchors and warps. Mainsail, working, storm and balloon jibs. Two spinnakers with spars. Standing rigging recently renewed. Hull and all equipment in prime condition. Fast, able and most comfortable cruiser of her size in Narragansett waters. Sleeps five. W. I. Angell, P. O. Box 1466, Providence, R. I.

* * *

No. 8473—For Sale—The most unique boat built during 1916. 50 ft. o. a., 12 ft. beam, 2.4 ft. draught. A houseboat with speed. Four staterooms and bath. Exceptionally well built—double and triple cedar planking. Copper and brass screw fastenings. 85-h.p. Van Blerck engine; speed 11.68 miles per hour. Capable of any sort cruising and economically maintained. Address Stanley M. Seaman, 220 Broadway, New York City.



14877



8473

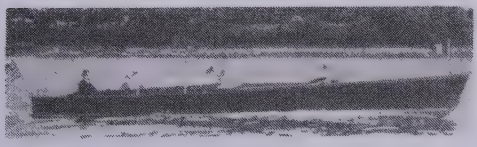


14884

No. 14884—For Sale—Very attractive Lawley-built keel cruising sloop, 37 ft. 6 in. o. a., 25 ft. w. l., 9 ft. 6 in. beam, 6 ft. draught. The very best Lawley construction throughout. Hard pine planking, copper fastenings, white oak frames. Very handsome cabin with full headroom. Toilet, folding lavatory, wide transoms, sideboards, etc. Ample room forward for a man. 6,000 lb of lead on keel. Watertight cockpit and handsome wheel. Bright deck with mahogany trimmings. May be seen at Marblehead, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 464—For Sale—One of the well-known Elco 36-ft. express runabouts. Speed 24 miles. Mahogany hull and finish.



464

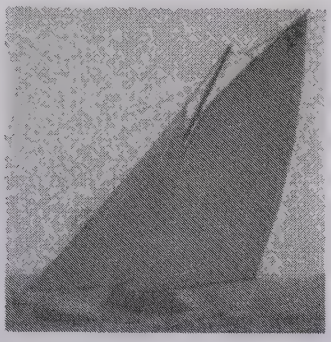
Engine and hull in excellent condition. Price reasonable. Harry W. Sanford, 500 Fifth Avenue, New York City.

* * *

No. 4392—For Sale—Class Q sloop, 43.3x27.6x8.8x6 ft. Ratsey & Lapthorn sails, 880 sq. ft., in good condition. Spars, good. Two transoms. Has 10-ft. dinghy. Was built for racing and therefore all possible fittings omitted. Could readily be made into a comfortable cruiser by the installation of bulkhead, toilet, etc. As it stands, boat is in generally first-class condition, and is available at a reasonable figure. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.



4392



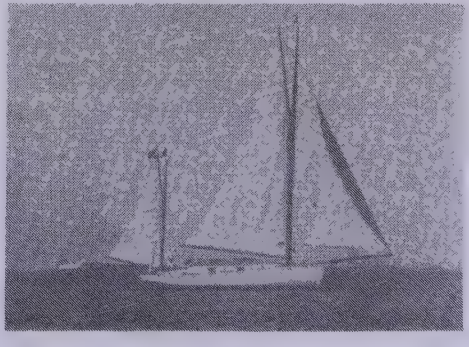
14882

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No. 14882—For Sale—One of the fastest boats of the 18-ft. Knockabout Association of Massachusetts. Built in 1905 in the best possible manner from designs of Small Brothers. 31 ft. o. a., 18 ft. w. l., 7 ft. 6 in. beam, 5 ft. 3 in. draught. 2,085 lb of lead on keel. Cousens & Pratt sails, new in 1914; 450 sq. ft. in area. New Pigeon hollow spars; Merriman blocks. Very fast and has won many prizes. Watertight bulkheads. Cost $1,275 to build. Sacrifice price $275 takes her. May be seen at Gloucester by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14774—For Sale—Attractive and able cruising yawl Eufaula, 33x27x12x3. 6 ft. headroom. This boat is exceptionally well built and very comfortable. Main cabin has four large berths. Forward of cabin is galley, ice-box, toilet and storage. In after end two full-length and two small lockers. Good size self-bailing cockpit; steers with wheel. Full cruising inventory. Winter covering; heavy mooring and buoy. A 10-ft. cedar dinky, 12-ft. power tender, which tows yawl four miles per hour. Reason for selling, owner can not use her. N. W. Littlefield, Jr., 26 Washington Street, Central Falls, R. I.



14774



14851

No. 14851—For Sale—Very attractive steam yacht, 86 ft. o. a., 78 ft. w. l., 12 ft. beam, 4 ft. draught. Built by Charles L. Seabury in 1901, from designs of Binney. 39 gross tonnage, 26 net tonnage. Triple-expansion Seabury engine, 7 in., 11½ in. and 17x10 in.; new condenser 1914. Speed 13 miles per hour. Almy water-tube boiler. Comfortable cabin, handsomely furnished and finished in mahogany and butternut. One large stateroom. Carries two boats on davits. Comfortable water-tight cockpit and spacious bridge. Completely equipped in every respect. This high-grade yacht can be purchased at a reasonable figure to settle an estate. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14887—For Sale—The famous sloop Sally VII. The fastest cabin 25-ft. w. l. sloop in the world. An unbeaten champion. 50 ft. o. a., 11 ft. 9 in. beam, 7 ft. draught. Built by George Lawley & Son Corporation at South Boston, Mass., in 1903 from designs of F. D. Lawley. Double planked with mahogany, copper fastenings, white oak frames. Hollow bronze keel with 2,000 lb of outside lead so arranged that shot can be poured in to change her trim as desired. Very comfortable cabin with wide transoms, locker, toilet, stove, etc. New suit of Ratsey sails and also an older suit of sails. Roomy water-tight cockpit. Steers with a wheel. Handsome white strip deck with mahogany waterways, king-plank and hatches. The best of phosphor bronze rigging, Oregon spruce hollow spars; mahogany Coleman blocks. Very complete equipment, including tender, cushions, khaki cover for sails and hatches, dishes, cooking utensils, anchor and cables, flags, binnacle, etc. A splendid craft for either racing or cruising. Stiff, able and easy to handle. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 733—For Sale—Very able cruising yawl, 37 ft. o. a., 30 ft. l. w. l., 11 ft. 2 in. beam, 5 ft. 2 in. draught. Built in Maine, 1908, on lines of fisherman. Has comfortable accommodations for four with toilet room and galley, four-cycle, four-cylinder Briscoe engine installed under cockpit giving speed under power of 8 miles per hour. Sails new 1914, not used 1916. Motor taken out 1916, thoroughly overhauled and not used since. Completely equipped with linen, compass, anchors and cables. Six-hole coal range, upholstery, etc. Electric lights, running water. Plainly finished but very able. For sale as owner has purchased large boat of same type. Apply John G. Alden, 131 State Street, Boston, Mass.



14887



733

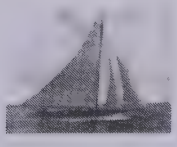


4442

No. 4442—For Sale—38-ft. modern raised deck cruiser, one-man control, copper fastened, two cabins separated by spacious bridge deck, exclusive toilet facilities in each cabin, sleeps eight, electric lighted, including running lights, refrigerator, 300 lb ice capacity. Heavy-duty, four-cylinder, four-cycle motor, speed 10 miles, gasolene capacity, 200 gals. Auxiliary sails. Completely found and equipped. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 1731—For Sale—Buzzards Bay 30-footer. 46.6 ft. o. a., 10.10 ft. beam, 5.4 ft. draught. Centerboard and keel. One tender. Ratsey & Lapthorn sails. Thoroughly seaworthy. Sleeps



1731

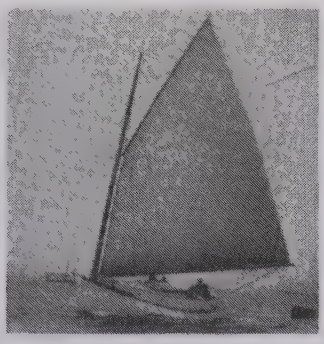
four in cabin. Good condition. Owner anxious to sell, having purchased larger yacht through us. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 14897—For Sale—Fast sonder boat, 35 ft. 6 in. o. a., 19 ft.



14897



14891

6 in. w. l., 7 ft. 8 in. beam, 5 ft. 2 in. draught. Built by James E. Graves at Marblehead, Mass., in 1910, from designs of Crowninshield. White cedar planking and copper fastenings. 1,975 lb of lead on keel. New mast. Wilson & Silsby sails. Best of rigging and blocks. Has won numerous prizes. Easy to handle, stiff and able. Can hold her own with any sonder boat afloat. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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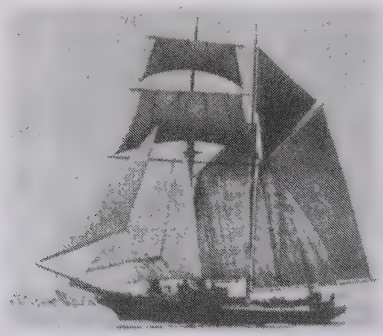
No. 14891—For Sale—Auxiliary Cape cat. 26 ft. o. a., 11 ft. 8 in. beam, 2 ft. 5 in. draught. Very large cabin with unusual headroom. Separate room with toilet, wash-bowl and running water. 10-h.p., 1915, two-cylinder Lathrop motor under cockpit floor. Two copper tanks, holding about 24 gallons each on each side under the deck. Small sail, easily handled. Fast under sail in a breeze and faster than many power boats under engine. Very stiff and able. Complete equipment, including cushions, life-preserver, three anchors and cables, tools, etc. Price $950. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 569—For Sale—Cruising knockabout, 40 ft. o. a., 25 ft. l. w. l., 10 ft. beam, 4 ft. 9 in. draught without centerboard. Built 1902. Full headroom, 5,600 lb outside lead ballast. Has comfortable cabin for cruising with accommodations for three aft and folding berth forward. Has toilet and separate galley fitted with stove space, ice-box, etc. Boat does not pound in rough water and is a smart sailer, especially to windward. In first-class condition throughout. Apply John G. Alden, 131 State Street, Boston, Mass.



569

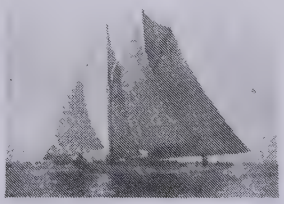


587

No. 587—For Sale—67-ft. aux. schooner, sleeping accommodations for six to eight persons, one bathroom. Yacht of recent build and has had the best of care. An exceptionally seaworthy and comfortable cruiser, in first-class condition. Fast under sail and long-distance cruising. Copper sheathed below waterline. Designed particularly for long-distance cruising, having made cruise to the West Indies. Now in commission. Price attractive. Harry W. Sanford, 500 Fifth Avenue, N. Y. City.

* * *

No. 488—For Sale—Aux. schooner, 93x19x19.6 ft. Sleeping accommodations for five persons—one bathroom. This yacht has been thoroughly kept up and is in excellent condition. Thoroughly overhauled in the Spring of 1916, including new



488

mainsail and foresail. Engine new, 1915. Yacht completely equipped and can be bought at an attractive price. Harry W. Sanford, 500 Fifth Avenue, New York City.



14888

No. 472—For Sale—Aux. ketch, 97x20x4.6 ft. This yacht is one of the best boats of her type. Extremely seaworthy and comfortable. Accommodations for eight to ten persons; two single and two double staterooms; two baths. Yacht is very well equipped—has open fireplace and excellent ventilation. Ideal yacht for extensive cruising. Price reasonable. Harry W. Sanford, 500 Fifth Avenue, New York City.

* * *

No. 14888—For Sale—30-ft. raised deck cruising launch, built by Wilton Crosby, at Osterville, Mass., in 1909. 8 ft. 6 in. beam, 3 ft. draught. 12-ft. watertight cockpit. Cabin 13 ft. long with 5 ft. 6 in. headroom. Speed 9 miles an hour. Excellent seaboat. 25-h.p., four-cylinder Sterling engine, new in 1913, and in perfect running order. Bosch Du-4 magneto. Two 30-gal. copper tanks for gasolene under seats in the cockpit. Electric lights in cabin. 10-in. electric searchlight. Cabin sleeps three people comfortably. Toilet, galley, etc. Complete equipment, including hair cushions, jib and mainsail. All in good condition. May be seen near New Bedford, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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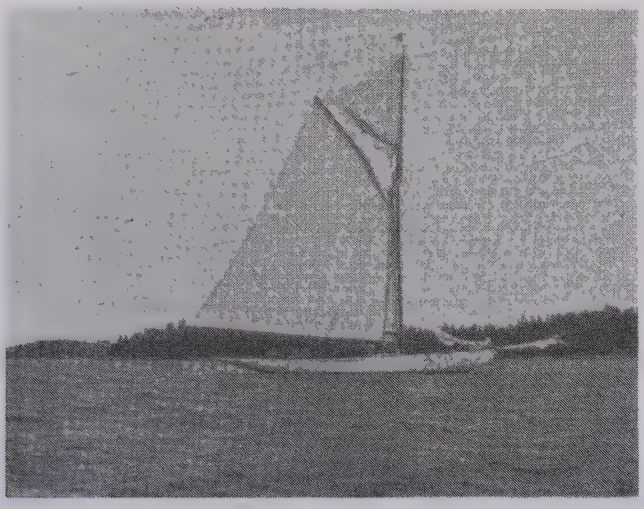
No. 14889—For Sale—The best runabout in Boston waters. 35 ft. long, 6 ft. 8 in. beam, 2 ft. 3 in. draught. Built in 1915, by day labor, from designs of E. N. Burwell. Can make 15 miles an hour all day long. 48-h.p., four-cylinder Scripps motor with electric starter. Complete top and wind shield. Motor located under forward deck, easily accessible. 14-ft. cockpit seats twelve people comfortably. Finest construction throughout with mahogany trimmings. Built to transport owner from Summer home to city. Cost over $3,000. Bargain price of $1,750 takes her. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



472



14889



14886

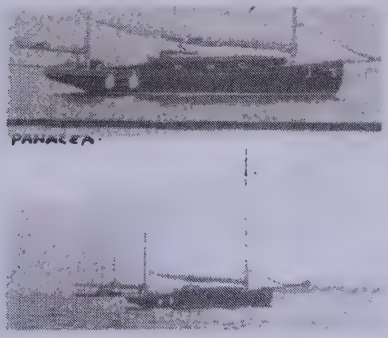
No. 14886—For Sale—Auxiliary sloop, 62 ft. o. a., 42 ft. w. l., 15 ft. 2 in. beam, 7 ft. draught. Gross tonnage, 27. Built by J. M. Bayles & Son at Port Jefferson, Long Island, N. Y., from designs of H. C. Wintringham. 10 tons of lead on keel. Roomy cabin finished in mahogany with 6 ft. 2 in. headroom and two wide transoms. One double and one single stateroom. Two toilets, captain's stateroom, large galley and roomy forecastle. A new 1916 Lathrop motor, excellently installed so that it can be operated without interfering with the cabin arrangements at all and entirely out of view. Extra heavy construction. Fast, stiff and able. In 1914 cruised to Labrador. Splendid craft on which to spend the Summer. Comfortable watertight cockpit with wheel and binnacle. Complete cruising equipment. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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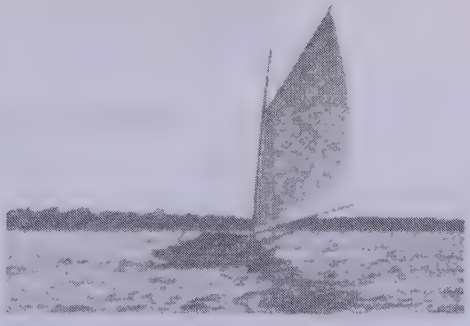
No. 14771—For Sale—Auxiliary yawl, 37x30x12.3x3. Three-cylinder, four-cycle, 15-18-h.p. Palmer motor with disc clutch. 8 miles under power. 5 ft. 10 in. headroom. Main cabin, 8-ft. berths. Stateroom, galley with large ice-box, large lockers, berth for man in forecastle. Mahogany house and trim. Ballast 4,000 lb copper slag pigs. Complete inventory. Boat has had only one previous owner, has always had best of care, and is in splendid condition—sound, tight above and below. Hauled out and housed at Lindstrom's Yard, Shippan Avenue, Stamford, Conn. Asking price, $1,900. Owner, Geo. P. Metzger, 95 Madison Avenue, New York City. Telephone, 5946 Madison Square.

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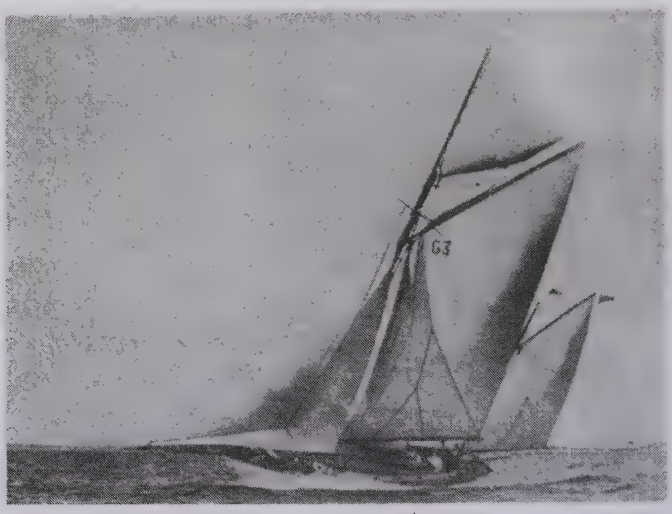
No. 14775—For Sale—23x10x3.6 keel auxiliary sloop Rival III. In A-1 condition. Used only five Summers. Excellent boat for cruising. Cabin sleeps three comfortably. 4.6 headroom. Owner has cruised extensively throughout Buzzards Bay, Nantucket Sound and about the Cape. Full equipment, including two anchors and cable, cushions, blankets, storm-jib, sail covers, lights, etc. 6-h.p. Model R Eagle engine installed new in 1914. Paragon reverse gear; in good condition. Can be seen Walter Chace's Shipyard, Fairhaven, Mass. (opposite New Bedford). For further particulars, apply to J. H. Ackerman, 131 Crescent Avenue, Plainfield, N. J.



14771



14775



2846

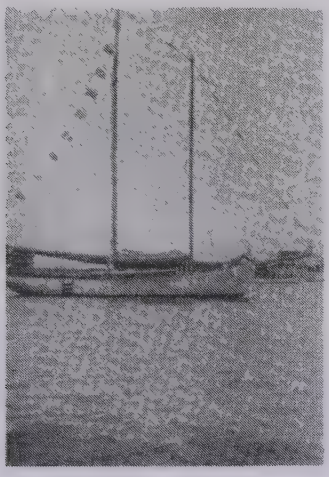
No. 2846—For Sale—Able and substantial yawl, in good condition. 51 ft. o. a. x 35 ft. w. l. x 13 ft. beam x 7 ft. draught. Gross tonnage, 7. One single stateroom. Four berths in cabin, 1,500 sq. ft. of sail. Three tenders, including a new launch, 1916, with 6-h.p. Ferro engine. Full equipment of crockery, blankets, etc. Will be sold at reasonable price. For further particulars inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 1301—For Sale—Nearly new auxiliary yawl Cygnet, plans of which are shown on page 179. 42 ft. o. a., 29 ft. l. w. l., 10 ft. 4 in. beam and 6 ft. draught. Designed by John G. Alden and built by F. F. Pendleton, of Wiscasset, Me., 1915. 6,000 lb. outside iron ballast; about one ton lead inside. Has four-cylinder, 17-25-h.p. Sterling engine, giving speed under power of 7 miles per hour, electric lights. Accommodate four aft with folding berth forward. Cygnet has had best of care and is, if anything, in better condition than when new. Could not be duplicated for less than $5,000. Apply John G. Alden, 131 State Street, Boston, Mass.



1301

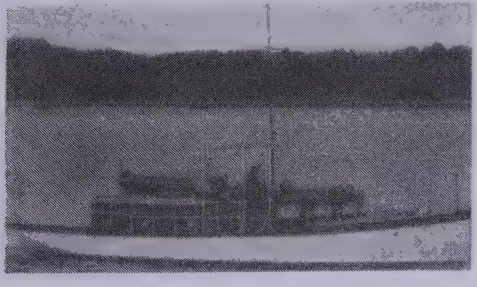


12007

No. 12007—For Sale—An unusually able seagoing auxiliary schooner yacht, 45 ft. o. a., 39 ft. w. l., 14 ft. beam, 4.6 ft. draught. Large cabin with four berths and transoms can sleep eight if desired. Headroom 6 ft. 24-h.p. Standard engine gives speed of 7 to 8 miles per hour. Electric lights. Exceptionally heavily constructed and fully furnished including two new tenders, 1915. Whole outfit in first-class condition. Low price for immediate sale. Address Stanley M. Seaman, 220 Broadway, New York City.

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No. 14896—For Sale—44-ft. motor yacht. 9 ft. 4 in. beam, 4 ft. draught. Designed and built by L. A. Coombs at Belfast,

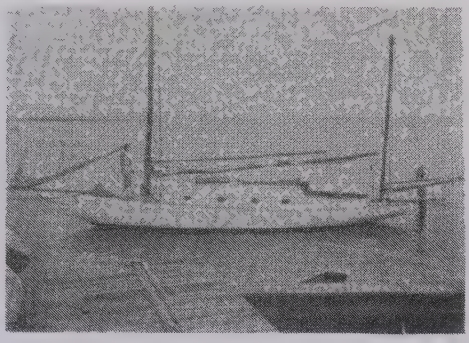


14896

Me., in 1910. Equipped with a 50-h.p., 1915, four-cylinder Holmes motor. Roomy cabin with full headroom. One state-



10



11710

room. Two toilets. Carries a tender on davits. Complete equipment, including cushions, electric lights, new carpets, dishes, cooking utensils, etc. High-sided, comfortable, dry and able. Steers from bridge. Military mast, awnings, etc. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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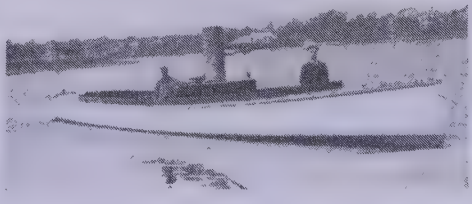
No. 10—For Sale—57-ft. oil burner. Licensed to carry 70 persons. Speed 10 miles per hour. Very economical to run. Harry W. Sanford, 500 Fifth Avenue, New York City.

* * *

No. 11710—For Sale—Centerboard auxiliary cruising yawl, 36 ft. o. a., 26 w. l., 10.7 ft. beam, 3.4 ft. draught. Comfortable cabin with two berths. Separate toilet and galley. Headroom 6 ft. Pipe berth forward. 7-h.p., four-cycle Vulcan motor, installed 1915, gives speed of 6 miles per hour. Fully furnished, including two suits of sails. New mast, bowsprit, rigging, spinnaker and boom, 1915. Whole outfit in first-class condition. Low price. For further particulars apply to Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 14895—For Sale—The well-known steam launch Veritas, the coaching launch of the Harvard University crews. 51 ft. long, 8 ft. beam, 3 ft. draught. Built by C. L. Seabury at Morris Heights, N. Y., in 1900 from designs of Crowninshield. 75-h.p. three-cylinder, 4-in., 8-in., 12-in. by 8-in. Seabury engine. Roberts water-tube boiler, new in 1914. Speed 13 knots. One ton fuel capacity, two water-tanks, 300 gals. capacity. Cedar planked and copper fastened. Can carry 30 people. May be seen at Cambridge, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14895

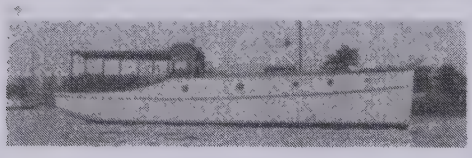


14892

No. 14892—For Sale—Handy little catboat, 23 ft. o. a., 20 ft. 6 in. w. l., 9 ft. beam, 18 in. draught. Designed and built by C. A. Borden at South Boston, Mass., in 1906. Very well constructed. Red cedar planking, white oak frames and copper fastenings. 10-ft. cockpit. Sail area, 300 sq. ft. Stockless anchor and cable, oars, boat-hook, sail cover, etc. A splendid boat for afternoon sailing. Stiff, fast and seaworthy. Price $200. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 5238—For Sale—35-ft. raised deck cruiser. 10-ft. main saloon with 6 ft. headroom. Single stateroom. Sleeps six. 20-h.p. Lathrop engine gives cruising speed of 8 miles. Controls



5238

from cockpit. Inspectable near New York. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.



14890

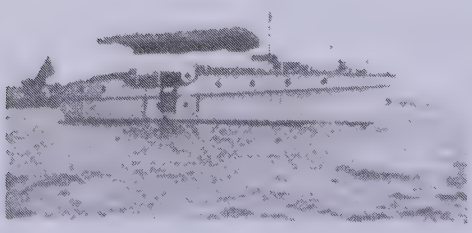
No. 14894—For Sale—40-ft. cruising motor boat. 8 ft. 6 in. beam, 4 ft. draught. Roomy cabin with 6 ft. 2 in. headroom, 10 ft. 6 in. long. Stateroom aft 10 ft. long. Toilet forward. Equipped with a 25-h.p., 1915, four-cylinder Loew-Victor motor in perfect condition. Complete cruising equipment, including a 1916, 10-ft. cedar tender on davits, new awning. American Ship Windlass Co. capstan, new corduroy cushions, lights, flags, etc. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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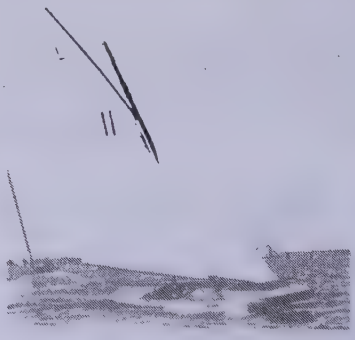
No. 14890—For Sale—38-ft. motor boat, 9 ft. 6 in. beam, 3 ft. draught. Built in 1912. Roomy cabin finished very handsomely, 25 ft. long with 5 ft. 10 in. headroom. Toilet aft on port side, galley, lockers, and wide transoms. 30-h.p., four-cylinder Jager motor installed in 1914, giving speed of 10 miles an hour. New bronze shaft and propeller. Very well constructed and has always been kept in perfect condition. Very attractive in appearance. Perfect single-hander. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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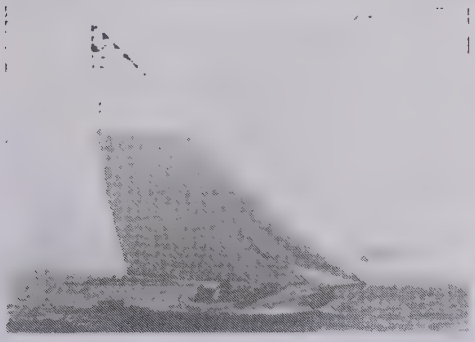
No. 14893—For Sale—Crack sonder boat, 37 ft. o. a., 19 ft. 5 in. w. l., 7 ft. 1 in. beam, 5 ft. 2 in. draught. Designed and built by W. S. Burgess Company at Marblehead, Mass., in 1911. Beautifully constructed with mahogany planking, copper fastenings and oak frames. 2,000 lb of lead on keel. Two suits of sails made by Ratsey, 550 sq. ft. in area. Will always be at the top of her class as she is a noted prize winner. Price reasonable. Can be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14894



14893

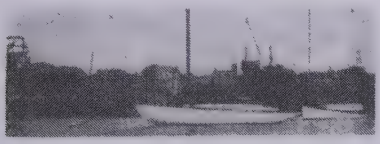


483

No. 483—For Sale—Bar Harbor 31-footer, 49x21x10.4x7.3 ft. draught. Two suits of sails, one very little used. Rigging in excellent condition. A fast, able, and comfortable cruiser that has been well kept up. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 5750—For Sale—Auxiliary keel and centerboard sloop, 32.4 ft. o. a. x 9.9 ft. beam x 3.6 ft. draught. Commodious cabin, fully equipped for cruising. New sails, September, 1916. 3½-



5750

h.p. engine. Bright tender. Bargain price for quick sale. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 14768—For Sale—Auxiliary Cape cat, 26x11.6x2.6. Built by Phinney. Unusually handsome and graceful boat. 12-h.p. Lathrop two-cylinder engine used but little. Two-blade propeller houses in deadwood. Very fast under power. Ballast 1,800 lb cast-iron. Steers and handles easily under sail. Fine new mast. Sail only fair. Complete hair cushions for cabin and cockpit, but need re-covering. Large, roomy cockpit and a fine, comfortable, able boat. Hull absolutely sound and as tight



14768



6054

as a drum around mast. Sold for no fault. Price $550 for quick sale. Hauled out at Cole's Yard, North Plymouth. Waldo Kennard, Duxbury, Mass.

* * *

No. 6054—For Sale—Auxiliary caravel yacht; the most picturesque houseboat in America; extraordinary accommodations on deck and below. Should be seen to be appreciated; a comfortable, safe cruiser. Has covered the coast between New York and Bar Harbor several times. If stripped of her caravel rig and high bulwarks and rails, the hull would still make a most desirable houseboat. Further particulars from Tams, Lemoine & Crane, 52 Pine Street, New York City.

* * *

No. 520—For Sale—48-ft. boat, licensed to carry 60 passengers,



520

practically new. Price attractive. Harry W. Sanford, 500 Fifth Avenue, New York City.

* * *

No. 274—For Sale—50-ft. schooner yacht. Springfield motor just installed. Large cabin and forecastle. Two boats. $1,800. Will exchange for a schooner about 65 ft. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.



274

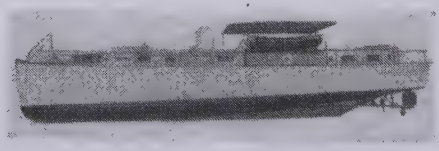


5304

No. 5304—For Sale—Twin-screw cruiser, 50x13x3 ft. draught. Speed 10 miles. Headroom 7 ft. 6 in. Fine saloon, toilet and galley. Roomy and comfortable. Electric lights. Screens for all windows and ports. After deck over 16 ft. long, with low bulwarks and rail. Two four-cylinder, 5x6½ Standard motors, with deck controls. Construction, finish and equipment first-class. Fully found, including regular yacht companionway ladder, two dinghies and davits, three anchors and chains. Awnings, etc. Must be seen to be appreciated. Owner recently purchased larger yacht and will sell this 50-footer at reasonable figure. Strong & Bickmann, Yacht Brokers, 42 Broadway, New York City.

* * *

No. 14777—For Sale—A 50-ft., 16-mile mahogany yacht, self-starting motors, all lights electric, seven berths, upholstering hair on springs, gasolene, 500-gal.; water, 80; oil, 55; copper



14777

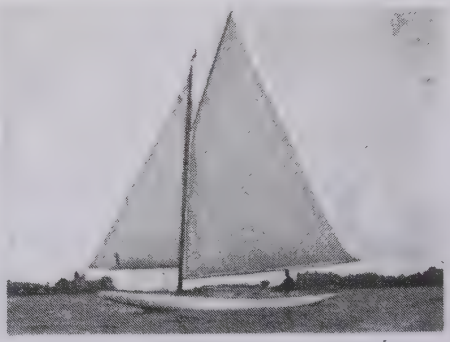
tanks. Steel bulkheads, copper riveted, anchors, 100 fathoms chain, refrigerator, coal stove, lavatories, sails, rigging, etc. Albert A. Morton, Worcester, Mass.

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No. 502—For Sale—High-grade fast cruising sloop, 41 ft.



502



14898

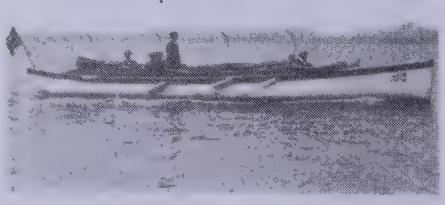
o. a., 25 ft. l. w. l., 10 ft. beam, 6 ft. draught. Designed by Crowninshield, built by Lawley in best possible manner, 1901. Has large cockpit and comfortable cabin, sleeping four with lockers, sideboards, etc., forward of which is large galley. Is in excellent condition throughout and is not strained in any way. For sale at low figure. Apply John G. Alden, 131 State Street, Boston, Mass.

* * *

No. 14898—For Sale—One of the famous 18-ft. knockabout class, 30x18.2x7.2x2.6 ft. Built in very best manner by C. C. Hanley in 1902. Centerboard, 1,120 lb lead ballast, all outside. Uncapsizable with advantage of light draught. Strong, tight and smooth. Cedar planking, oak frames, fastenings brass screws. Watertight cockpit of good size. Mahogany seats and companionway. Deck, bright, narrow, bent strips. A very stiff and able boat, fast under all conditions. Easily handled, and an especially desirable boat for boys, or for afternoon sailing and short cruising. A very high-grade boat, and as the owner cannot use her, she is offered for sale at $350—less than one-third of her cost. Laid up near Boston. May be seen by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 14899—For Sale—Very attractive launch. Built in 1912 at Gloucester, Mass., by P. A. Wheeler. 35 ft. 8 in. o. a., 35 ft. w. l., 6 ft. 8 in. beam, 2 ft. 6 in. draught. Planked with cedar and copper-fastened. Equipped with a Campbell, three-cylinder, four-cycle, 18-h.p. motor, and at a normal speed of 600 revolutions, makes 12 miles per hour. Two cockpits, one 4 ft., forward; and the other aft, 8 ft. Has folding awning the whole length and seats 35 people. Mono metal fittings. One tender. Cost over $2,500, and can be purchased at a bargain figure, $900. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



14899

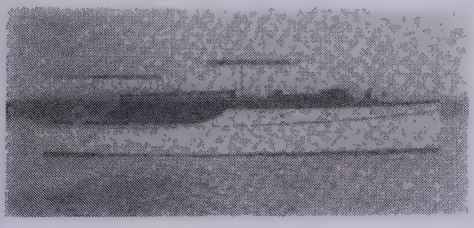


15000

No. 15000—For Sale—Very attractive 25-ft. w. l. sloop, 40 ft. 9 in. o. a., 10 ft. breadth and 6 ft. draught. Built in 1903 from designs of William H. Hand, Jr. Handsomely finished inside and out. 5 ft. 8 in. headroom, toilet and lavatory. Cousens & Pratt sails, about 975 sq. ft. in area. 6,000 lb of outside lead on keel. Roomy, watertight cockpit. Completely equipped for cruising, stove, lights, cushions, ice-chest, etc. Unusually graceful in appearance, stiff, able and extremely fast. An ideal boat for cruising or racing. Bargain price. Can be seen at Falmouth, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

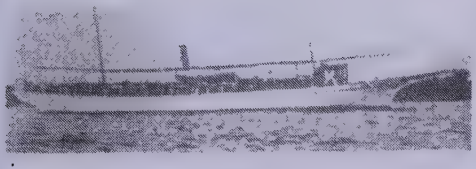
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No. 4488—For Sale—Attractive bridge deck cruiser, 38 ft. o. a. x 8.6 x 3 ft. draught. Oak frames and cedar planking. Copper fastenings. Bright mahogany interior finish. Full

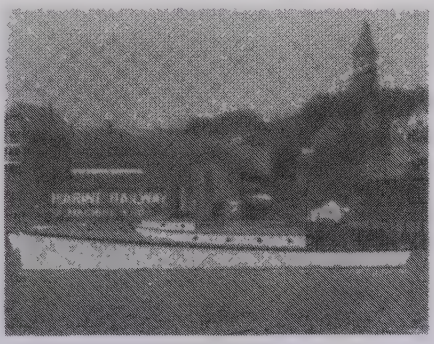


4488

headroom. Sleeping accommodations for four. Fresh-water tank holds 80 gallons. Steers from bridge deck; has also mahogany tiller in after cockpit. Its 25-40-h.p. Loew-Victor engine gives cruising speed of 12 miles. Electric lights and searchlight. Carries 12-ft. tender. Was completely overhauled last Spring, and will prove an exceptional value. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.



5693



15034

* * *

No. 5693—For Sale—Single-screw steam yacht, 82 ft. o. a. x 70 ft. l. w. l. x 12.6 ft. beam x 5.6 ft. draught. Gross tonnage, 30. Compound 50-h.p. engine, water-tube boiler covered with asbestos. New propeller. Cruising speed, 10 to 12 knots. Operates economically. From water-line down, hull is sheathed with copper. Sleeps seven in owner's party. Two toilets. 17-ft. power-boat and small rowboat. Owner will sell at reasonable figure, having bought larger boat. For further particulars, inquire Gielow & Orr, 52 Broadway, New York City.

* * *

No. 15034—For Sale—Fast 42-ft. motor boat, built in 1907 from designs of Swasey, Raymond & Page, by Fox, of Cohasset, Mass. 6 ft. beam. 2 ft. draught. Equipped with a 48-h.p. Speedway motor which drives her over 15 miles per hour, 6-cylinder, 4-cycle, new 1915. Full headroom in cabin forward. Just the boat to act as a daily ferry from gentleman's Summer home to city as she is fast and seaworthy. Great bargain. Can be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 5348—For Sale—Bargain. Handsome glass cabin cruiser, 50x11x3.6 ft. Raised pilothouse, cabin, toilet, galley, etc. Good after deck. Built by Elco Company. Globe engine. Is in fine condition throughout. Well found. Speed 10 miles. Ideal family cruiser. Excellent boat for taking out parties. Can be had at low price as we recently sold owner a larger yacht and he has no use for two boats. Strong & Bickmann, Yacht Brokers, 42 Broadway, New York City.



5348



14773

No. 14773—For Sale—Fast and safe catboat of Duxbury Y. C. 14-ft. Class. 14 ft. l. w. l., 17 ft. o. a., 7 ft. breadth. A nice boat for afternoon sailing; new last season, and for sale reasonable. W. H. Covington, Plymouth, Mass.



14769

No. 14769—For Sale—Modern auxiliary yawl, 48 ft. o. a., 30 ft. w. l., 13 ft. beam, 5 ft. draught, 4-ton lead keel, large cabin, two berths and two transoms, large galley, accommodations for two men forward, large toilet and lavatory, interior of cabin and



5309



15011

cockpit paneled in mahogany, bright decks, complete cruising outfit, two tenders, sails new 1915, 12-h.p. Palmer motor, 1915, boat fast and able, thoroughly overhauled, in first-class condition. L. N. Martin, Room 316, 2 Rector Street, N. Y. City.

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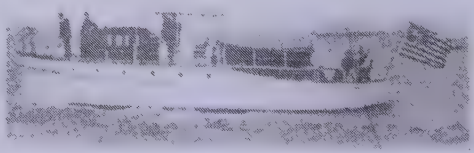
No. 5309—Real bargain. Day cruiser, 50x11x3 ft. Strongly constructed; nicely finished. Roomy cockpit fore-and-aft. Four-cylinder, 30-h.p. Murray & Tregurtha engine, with controls at steering wheel in forward cockpit. Comfortable cabin with toilet and galley. Speed 10 miles. Boat has had little use and is in good condition, which an inspection will readily show. Here is an opportunity to get a fine boat for little money. Strong & Bickmann, Yacht Brokers, 42 Broadway, New York City.

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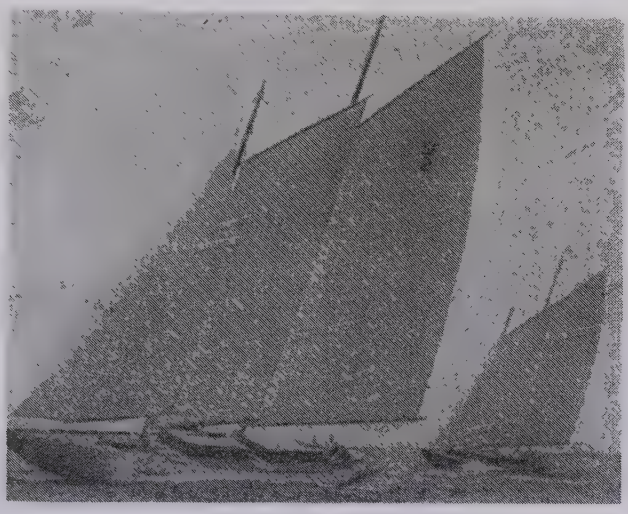
No. 15011—For Sale—Very attractive, 17-ft. w. l. cruising knockabout, 27 ft. o. a., 7 ft. 4 in. beam, 4 ft. 4 in. draught. Designed by Fred Lawley and built by Wilton Crosby at Osterville, Mass., in 1906. Watertight cockpit finished in mahogany, lead ballast. Ample cruising accommodation for two persons. Sails made in 1916 being absolutely new and 350 sq. ft. in area. Very seaworthy boat. Owner has cruised from Casco Bay to New London around Cape Cod. Bargain price. May be seen at Gloucester, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 5081—For Sale—Roomiest boat of size both below and on deck; 46x11x3.6 ft. draught. Substantially constructed. Solid mahogany joiner work. Large saloon and double stateroom with sleeping accommodations for six besides captain. Liberal locker space. Toilet and galley. Four-cylinder, 30-h.p. 20th Century motor with deck control. Electric lights; two boats; new awning. Fully found. Excellent condition. Speed 11 miles. Price reasonable. Strong & Bickmann, Yacht Brokers, 42 Broadway, New York City.



5081



15010

No. 15010—For Sale—One of the Stamford Y. C. One-Design Class 40-ft. w. l. schooners, 62 ft. o. a., 11 ft. beam and 7 ft. draught. Tonnage 16. Built in 1913 by Robert Jacob at City Island, N. Y., from designs of Cox & Stevens. Roomy cabin with full headroom. Double stateroom and single stateroom with berths in saloon for two. Washroom and toilet on port side. Galley located forward and across the whole boat. Berths for two hands forward in forecastle and crew's toilet. Bored for shaft so that motor can be easily installed if desired. 8 tons of lead on keel, 10-ft. watertight cockpit. Sails made by Ratsey, 1,523 sq. ft. in area. Very fast, stiff and seaworthy. Handles with perfect ease. Complete cruising equipment, including tender, cushions, flags, lights, cooking utensils, etc. An exceptional bargain. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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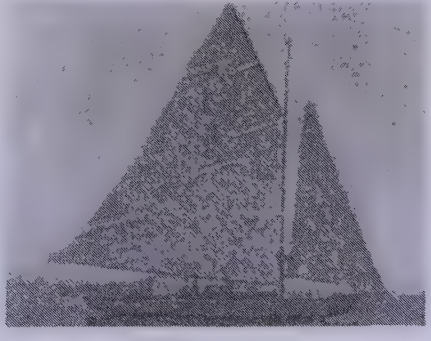
No. 15004—For Sale—Crack 21-ft. raceabout, 35 ft. 6 in. o. a., 7 ft. 6 in. beam, 6 ft. draught. Exceedingly well constructed, cedar planks, oak frames and copper fastenings. Small cabin-house with fair-sized cabin, having 4 ft. headroom; watertight cockpit. 3,400 lb lead on keel. Sails made by Wilson & Silsby in 1907, 600 sq. ft. in area. This is an ideal boat for afternoon sailing, or for short cruises. Fast, able and seaworthy, and can be purchased at a moderate price. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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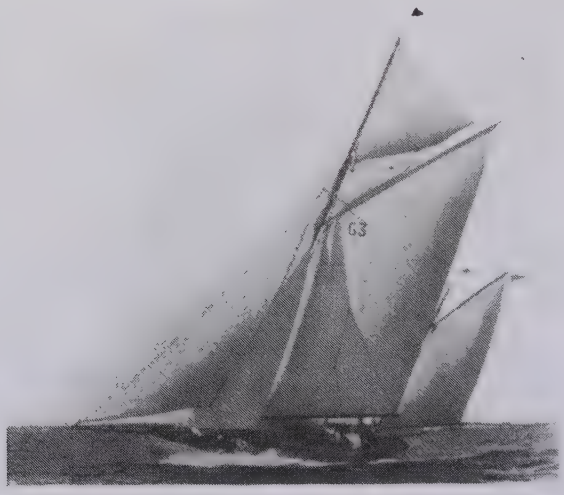
No. 15032—For Sale—Attractive little single-hander, 28 ft. o. a., 18 ft. w. l., 9 ft. beam, 2 ft. 8 in. draught. Combination keel and centerboard; centerboard entirely under cabin floor, 1,600 lb ballast, all outside. Watertight cockpit. Nice little cabin with 3 ft. 6 in. headroom, large enough to sleep in comfortably. Her moderate draught enables her to enter small harbors. Sails in fine condition, and she has brand new 9-ft. tender. Ice-chest, large locker, and drawers for clothing, provision box, etc. She has cruised extensively from Newport, R. I., to Boothbay, Me. Sacrifice price $275. This beamy, able little craft may be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15004



15032



181

No. 181—For Sale—Cruising yawl. 51 ft. o. a., 35 ft. w. l., 13 ft. beam, 7 ft. draught. Designed and built by Hodgdon Bros., 1904. Has comfortable cabin with four berths, single stateroom, large toilet room and galley with Shipmate range. Most comfortably fitted for cruising in every detail and everything in excellent order. Is fast sailer, extremely able and stiff, having cruised three times to the Bay of Fundy. Has three tons including first-class launch carried on deck which will tow three miles an hour. Laid up near Boston. For particulars, inspection permit, etc., apply to John G. Alden, 131 State Street, Boston, Mass.

* * *

No. 15005—For Sale—Very attractive, 17-ft. open motor boat. 5.3 ft. beam, 18 in. draught. Designed and built by Murray & Tregurtha Co., at South Boston, Mass., in 1913 at a cost of $795. High grade in every respect. 10-12-h.p. Ferro motor. Speed 16 miles an hour. Seats eight people comfortably. Spray hood and complete equipment. Planked with cedar and finished bright, copper fastened. Splendid boat for a yacht tender or for afternoon sailing. Dry, seaworthy and comfortable. Reasonable price. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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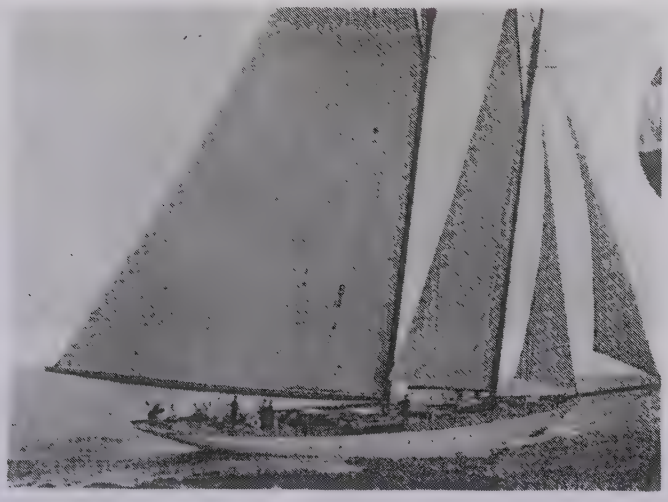
No. 14779—For Sale—Exceptionally able auxiliary keel cruising sloop. 32 ft. o. a., 21 ft. w. l., 9 ft. beam, 5 ft. 6 in. draught; 5½ tons displacement, very heavily constructed. About 2 tons lead, bronze fastened. Designed and built by Greenport Basin & Construction Company. 5-h.p. engine. Frames oak 2x2 in., spaced 12 in. apart; planking 1 in. cedar below; yellow pine topsides. Deck 1¼x1¼ in. white pine, bright. All outside trim mahogany. Lavatory, water tank, Sands' toilet, Primus range; complete cruising outfit; very roomy cabin; steers with a wheel, bronze gear. Winch, two anchors, awning, power tender, etc. Sloop and tender equipped with Thompson Automatic feathering propeller, eliminating drag. Cruised between Atlantic City and Gloucester. Hauled out at Harlem Y. C., City Island, N. Y. Price $800. Friedrichs, 770 St. Nicholas Avenue, New York City, N. Y.



15005

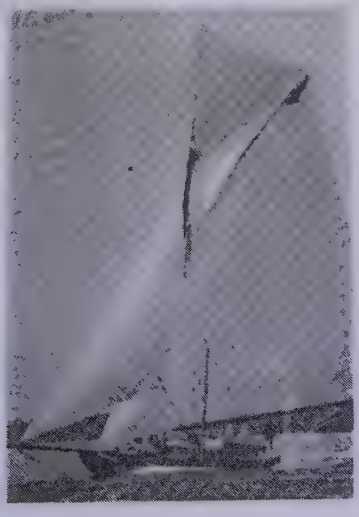


14779



519

No. 519—For Sale—Steel flush deck keel schooner yacht. Designed and built by Herreshoff Mfg. Co., Bristol, R. I. 127x87x24.3x14.2 ft. Lead ballast about 60 tons. Has five staterooms; large saloon; three bathrooms, and owner's dressing room. Completely equipped. Last in commission, 1916. Considered to be one of the choicest of the larger schooner yachts available for purchase. Heavily built and kept up in fine shape. Price $30,000. Described in our Illustrated Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York, N. Y.

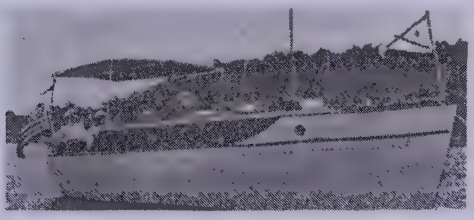


15006

No. 15006—For Sale—Light-draught cruising sloop, 50 ft. o. a., 33.6 ft. w. l., 14.6 ft. beam, 3.7 ft. draught. Designed by A. Cary Smith and built by W. W. Sweat at Tampa, Fla. Roomy cabin finished in mahogany with 6.6 ft. headroom. Double stateroom. Equipped in every detail to suit the most fastidious taste. Acetylene gas lighting equipment. Carries two boats on davits, one a dinghy, the other a motor tender with a 3½-h.p. Palmer engine. New khaki awning. Two large water tanks aft connected with a folding lavatory in the cabin, and to the galley sink. Two double berths in cabin with plenty of locker room and storage space. 200 lb ice-chest. Forecastle is arranged for crew of two or three and has a separate toilet. This yacht is unusually strongly constructed and does not leak even in a heavy sea. Sails in excellent condition and have khaki sail covers. All rigging new and in first-class condition. Complete cruising outfit. May be seen at Cold Spring Harbor, Long Island. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 15031—For Sale—New mahogany raised deck cruiser, 30x8 ft. Best construction throughout. Very attractive up-to-date, 1912 model. Equipped with a silent Ralaco motor and magneto, giving perfect satisfaction. Cabin can sleep four comfortably; toilet and two wardrobes, closets, lockers, etc. Two gasolene tanks, two water tanks and air tank and whistle. Complete inventory, including two anchors, cockpit and cabin cushions, lights, etc. May be seen near Boston. Bargain price if taken at once, as owner desires to build a larger boat. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15031

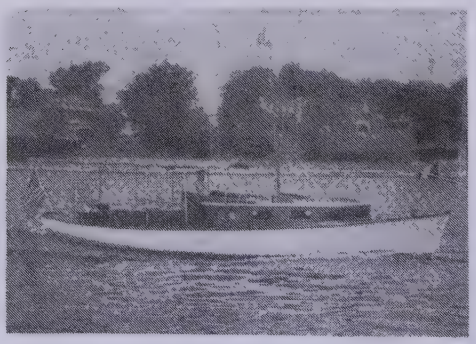


15033

No. 15033—For Sale—Owing to death of owner. A handsome twin-screw power boat, built for cruising in Florida and Southern waters, as well as along the New England Coast. A good stable craft for outside cruising. All rails, covering boards, deckhouse and cabin trunk finished in mahogany. 78 ft. 8 in. o. a., 70 ft. w. l., 12 ft. 6 in. beam and 4 ft. draught. Gross tonnage 48, net tonnage 29. Designed and built by Murray & Tregurtha Co., in 1906, at South Boston, Mass. Equipped with two Murray & Tregurtha heavy-duty motors four-cylinder, four-cycle, 60-h.p. each, which gives her a speed of 12 knots for cruising. Capacity of water tanks 1,000 gals., gasolene tanks 1,500 gals. Sleeping accommodations for seven guests. Full headroom in staterooms, saloon and cabin. Two double staterooms. Following deckhouse, which contains dining saloon, is a low cabin trunk with square glass windows. A roomy bridge is located just aft of deckhouse on forward end of trunk cabin. Roomy after deck, also deck space either side of cabin trunk, all enclosed with a double railing. Yacht has just been put in commission. Engines, equipment, paint and brightwork all in perfect order and boat is ready for sea at very short notice. Speedy launch and one rowing tender carried on davits. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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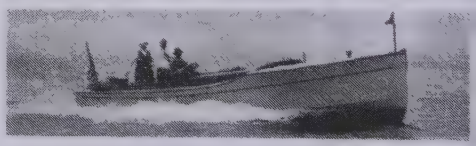
No. 15013—For Sale—Classic, hunting cabin cruising launch, 31 ft. by 7 ft. by 3 ft. draught. Designed by Cary Smith and Ferris, built by Gas Engine and Power Co., 1910. 10-h.p. Craig four-cycle engine, speed 9½ miles. Won 1911 Marblehead race—Cornfield Light Ship—New Rochelle race. Is an able seaboat. Oak keel and steam-bent oak frames, copper fastened, bronze rudder, quadrant, skag, etc. Cabin, decks and topsides mahogany. Cockpit 10 ft. long. Cabin contains two berths, ice-box, closet and shelves. Toilet forward. Cockpit covered with galvanized and brass awning frames. Khaki top, side and end curtains complete. Copper gasolene tank 50 gals. contained in drip pans. Copper, tin-lined 30-gal. water tank. Bilge pump and complete cruising equipment. Inspectable at Stephenson & Stonberg, New Rochelle, N. Y. Price $1,250. Further particulars through your own broker.



15013

* * *

No. 14799—For Sale—29-ft. Hand V-bottom runabout, 20 miles an hour, six-cylinder, 60-h.p. Loew-Victors. This picture was taken arriving in Newport Harbor last Summer, after making the run from Mattapoissett, Buzzard Bay, in a strong wind and heavy sea, in which she showed her ability as a

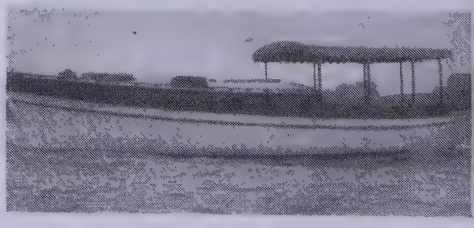


14799

wonderful sea-boat, being the first boat to arrive at Newport after the 35-mile run. Fitted with electric self-starter, electric running lights, runabout top and full Government equipment. Price $2,250. Apply A. L. N., 164 Locust Avenue, New Rochelle, N. Y.

* * *

No. 15008—For Sale—Exceptional bargain. $500. 32-ft. cabin motor boat, 8 ft. beam, 3 ft. draught. 10-ft. watertight cockpit with awning. Equipped with a 15-h.p. Mianus motor, giving a speed of 9 miles per hour. Electric lighting plant and searchlight. Cabin is 16 ft. long and has 5.6 ft. headroom. Two gasolene tanks located aft, capacity 60 gallons. Controlled from cockpit. Able, seaworthy and comfortable. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

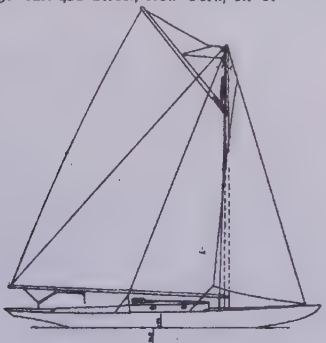


15008



522

No. 522—For Sale—Fast keel sloop, 36x26.6x7.6x6.6 ft. Designed by Tams, Lemoine & Crane, built by Wood, of City Island. Mahogany planking, all outside lead ballast. Cabin berths two. Completely found, cushions, stove, etc. Has proven a winner in the Handicap Class, Long Island Sound. Also rates in the Q Class. Yacht is in elegant condition, having a new cabin house added two years ago. Inspection invited. Illustrated in our Booklet. Free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York, N. Y.

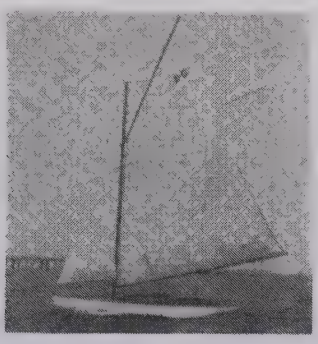


14772

No. 14772—For Sale—R class boat, built this winter. An excellent opportunity to secure a boat for this popular class, at a reasonable figure. Keel boat, with comfortable cabin. Ballast, sails and spars, to suit purchaser. W. H. Covington, Plymouth, Mass.



14787



15009

No. 14787—For Sale—Power yacht, double-planked mahogany, 74x69x10½x3½ ft., substantially constructed, five watertight bulkheads, designed and built by Herreshoff, signal mast type, trunk cabin, full headroom, with cockpit aft, steers from bridge, awnings over cockpit and bridge; interior finish mahogany, sleeps five outside of crew, separate w.c. for owner and crew, six-cylinder 20th Century engine, 8x10 in., speed 16 miles; windlass, rudder and all fittings are bronze; well found as to silver, glassware, crockery, linen, cushions, carpets, furniture, flags, etc.; copper gasolene tanks, electric lights, storage batteries. C. N. Wheeler, 5305 Seventh Avenue, Brooklyn, N. Y.

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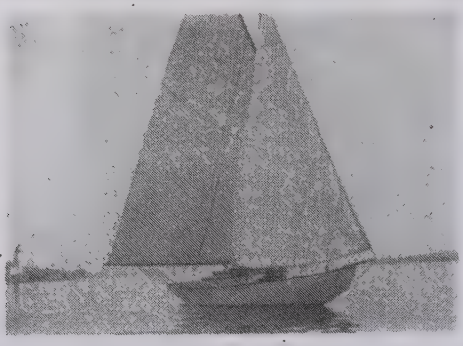
No. 15009—For Sale—21-ft. w. l. keel knockabout, 32.4 ft. o. a., 7.6 ft. beam, 5 ft. draught. Built by David Fenton at Manchester, Mass. 3,500 lb lead on keel. Cedar planked, copper fastened. Canvas deck. Two suits of sails, one new in 1916. About 600 sq. ft. in area. Cabin has two transoms and small skylight. Watertight cockpit. Very fast and has won many prizes, including Championship of Boston Y. C. A perfect single-hander. Bargain. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 14806—For Sale—Auxiliary cruiser, Daphne, 34 ft. o. a., 10 ft. beam, 3 ft. draught. Outside ballast 3,000 lb, inside 500 lb lead. Centerboard Tobin bronze 400 lb, four anchors and manila cables, one chain cable. All standing rigging phosphor bronze rope. Steers by wheel. Gray motor, 8-h.p., under cockpit. Cabin furnished in white mahogany and oak paneling; water-shedding cockpit. Brand new sails and cover. New hair cushions to sleep four comfortably. Fully found for cruising. Binnacle, taffrail log, brass side lights, etc. Designed by D. W. Tryon, built by Frank Smith, Fairhaven, Mass. $1,000. E. A. Bell, 226 West 59th Street, New York, N. Y.



14806



193

No. 193—For Sale—Auxiliary sloop, 33 ft. o. a., 23 ft. w. l., 9 ft. 6 in. beam, 4 ft. 8 in. draught; outside lead ballast 4,200 lb; Arthur Binney designed, very best possible construction, brass-screw fastened, handsome cabin with two wide transom berths, pipe berth forward, toilet and galley, good headroom, self-bailing cockpit, four-cycle 8-h.p. Palmer engine under cockpit, like new; very complete equipment for cruising. A wonderful small cruiser that can be depended on in any weather and a bargain for cash. Apply to Boston Yacht Agency, 15 School Street, Boston, Mass.

* * *

No. 15001—For Sale—36-ft. w. l. keel cruising schooner, 45 ft. o. a., 12 ft. beam, 6 ft. draught; 4 tons of iron on keel and 4 tons inside. Roomy cabin with full headroom. Double stateroom forward. Toilet room, galley with coal range, bath forward for a man. White pine deck, 7-ft. cockpit. Very similar in appearance and design to the American Cup winner, Puritan. Easy to handle, stiff and seaworthy. Bargain. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

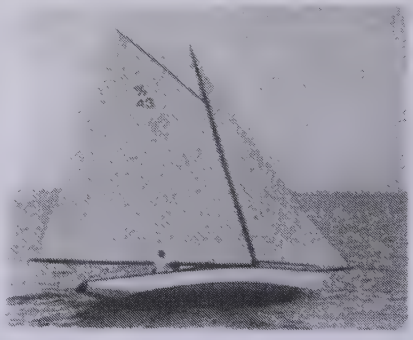
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No. 14803—For Sale—Sloop Kildee, 36x22x9x3.6 ft., combination keel centerboard. Designed by Boardman. Always had the best care. A-1 condition. 3,000 lb lead on keel. Oak frame, cedar planking, copper fastenings. Mahogany hatches and cockpit. Cabin has lockers, ice-chest and folding mahogany table. Sails in excellent condition; mainsail, jib, storm jib, spinnaker, ballooner. Complete equipment, including cabin cushions, pillows, blankets, stove, dishes, bell, charts, compass, brass blocks, lights, and excellent round-bottom tender. Price $600. Now stored at Groton, Conn., 15 minutes from New London station. May be inspected by applying to R. C. Simpson, 27 Alger Place, New London, Conn.



14803

No. 520—For Sale—Handy knockabout, 30x7.5x5 ft. Outside lead ballast. Two berths in cabin; stove, etc. New sails, 1916. Electric lights. Cleaned up 15 prizes out of 18 starts in season of 1916. Also has many prizes to her credit from other years. Hull has been burned off, redleaded and is in A-1



520

condition. Races in the Handicap and R classes, Long Island Sound. In pink of condition. Price $750. Inspectable near New York. Illustrated in our Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York, N. Y.



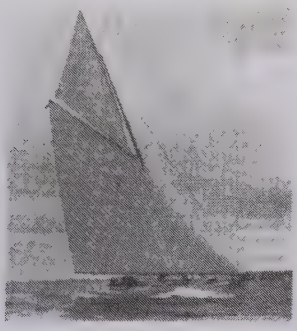
15001



14798



1002



517

No. 14798—For Sale—The commodious power whaleboat Marian, built by Casey Brothers in 1908. The Marian is 36 ft. 3 in. long, 9 ft. breadth and 3 ft. 3 in. draught. She is equipped with a three-cylinder Ferro engine, which gives a speed of 9 nautical miles an hour. The cabin accommodations are very complete and the interior finish is white enamel and mahogany. The equipment consists of compass and binnacle, two anchors, magneto, storage batteries, awning, etc. The fresh-water tank will hold 40 gals. and the fuel tank 60 gals. Price $2,500. Boat laid up at Moriches. Box 102, care of The Rudder Pub. Co., 254 W. 34th Street, New York City. (See illus., p. 232.)

* * *

No. 1002—For Sale—Shoal-draught schooner yacht, 60x18x 2.4 ft. Three staterooms; music room and dining room; stateroom for captain forward. Three toilets, four w.b. Two sets copper screens for door and windows; large pantry. Wolverine four-cycle motor. Burns kerosene or gasolene. Yacht cruised 7,000 miles, New York to New Orleans, Gulf ports, and return, on kerosene. The finest boat available for Florida, Great South Bay, or similar shallow waters. Has a permanent wooden Winter shed, just put on this season. Inspection invited. Illustrated in our Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York.

* * *

No. 15014—For Sale—Houseboat, 14x36 ft., built 1912. Planking yellow pine 3 in. sides, 2 ft. bottom; oak frames 4x4, trussed fore-and-aft and securely bolted together, 2 ft. headroom in hull. House, shingled; windows diamond-frame. Living room 13x15 ft., bedroom 7x8, with three-quarter bed (and drawers under) built in transom on side. Stateroom with large transom and pipe berth. Bathroom, 6x8, with 4-ft. enameled iron bath; toilet, wash basin, running water, clothes press. Kitchen 8x8; Shipmate range, four-holes; sink with running water; coal locker. Upper deck arranged with new galvanized awning frame, khaki top, weather cloths and complete side and end curtains arranged for good sleeping. Water tanks, 300 gals. located in hull. Inspectable at Stephenson & Stonberg, New Rochelle, N. Y. Price $1,200. Further particulars through your own broker.

* * *

No. 517—For Sale—Flush deck keel sloop. New York Y. C. 40-ft. Class. 59x40x14.5x8 ft. Will have the additional lead and bowsprit added to meet class requirements. Built by Herreshoff, 1916. Holystoned decks; hollow spars; two suits sails, one by Ratsey, one by Herreshoff. Main cabin has four separate berths. Owner's stateroom with double berth. The alteration in rig will undoubtedly make this class the finest on the Sound. Important changes of ownership recently in this class. Available for purchase by members of New York Y. C. only. Illustrated in our Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street New York, N. Y.

* * *

No. 15003—For Sale—Fast keel 18-ft. waterline sloop. 30.11 ft. o. a., 7.2 ft. beam, 5.10 ft. draught. Built under the restrictions of the 18 Foot Knockabout Association of Massachusetts by David Fenton at Manchester, Mass., in 1907, from designs of E. A. Boardman. Total weight, 4,165 pounds. 1,800 pounds of lead on keel. Sails made by Wilson and Silsby, 450 square feet in area. Hollow spars. Splendid boat for day sailing or racing. Stiff, able and absolutely non-capsizable. Bargain price $350. May be seen at Gloucester, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15014



15003



50

No. 50—For Sale or Charter—Steel twin-screw American-built steam yacht. One of the largest in tonnage built in this country. 282x240x36x16.11 ft. 1,800 tons, D. W. Classed 100 A-1 Lloyds. Has eleven staterooms; nine bathrooms; large dining room; separate breakfast room. Smoking room on deck. Five staterooms for domestics, maids, valets, etc. Two baths for domestics. Photo dark room; music room; large library. Separate bath and stateroom for captain; separate staterooms for officers. Ice plant makes 1,000 lb daily. Wireless, etc. Cost over $600,000 when built, and would now cost over three quarters of a million to build. A bargain at $225,000. All figures concerning bunkerage, consumption, payroll, etc., are in our files. A lengthy report prepared for us by two engineers from one of our leading shipyards, at considerable expense, is on our files and contains full facts about condition of hull, boilers, engines, equipment; cost of changing to fuel oil burner; capacity of water tanks; trimming tanks; double bottoms, and other valuable data. Illustrated in our Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York, N. Y.

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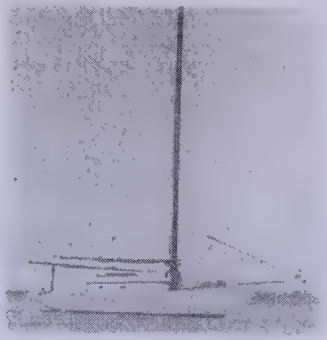
No. 14802—For Sale—Sloop Chinook, 36.9x8.6x5.10 ft. Designed by Crowninshield for "Q" Class, 1907. Sound, able and fast in all conditions, perfectly balanced, dry and does not pound in seaway. 800 sq. ft. sail in jib and mainsail. New mast, gaff, mahogany cockpit and forward hatch last season. Equipment includes anchor and rodes, running and anchor lights, compass, cushions, kerosene stove, spinnaker, storm jib and 10-ft. bright cedar tender. Ideal boat for day sailing and short cruises. Price $750, if taken before May 1st. Now stored at Groton, Conn., 15 minutes from New London station. R. C. Simpson, 27 Alger Place, New London, Conn.

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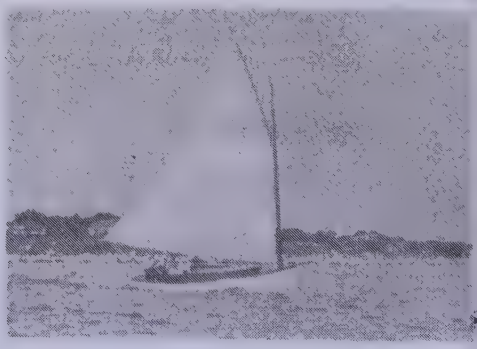
No. 15002—For Sale—Cruising auxiliary yawl. 38 ft. o. a., 27.6 ft. w. l., 11.6 ft. beam, 6 ft. draught. Built in 1902 in the best possible manner. Large cabin with wide transoms sleeping four separately. 6 ft. headroom. 9-h.p. Knox motor under cockpit, overhauled in 1915 by makers. Sails new, 1914. Complete cruising equipment including an 8-ft. round-bottom tender. Toilet room forward. 30-gal. water tank. Beamy and powerful and easy to handle. Price $1,800. May be seen in Boston, by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15002



14802



14788



2001

No. 14788—For Sale—Auxiliary Crosby catboat, overhang stern, spur bowsprit. 26x10½x2½ ft. Cabin 10½ ft. long. New 10-h.p., two-cylinder Mianus engine. New sail just ordered. 30-gal. gasolene tanks, 40-gal. water tank. One ton lead ballast. Bright house, deck and transom. Narrow strip deck. Cockpit and cabin finished bright with mahogany trimming. Cabin fitted with best hair and corduroy cushions, lockers, racks, galley pump. Everything perfect condition, paint and varnish right down to wood. Fast and able under sail or power. Fully found in every particular. Price $1,000. Joseph Guild, Jr., P. O. Box 3,535, Fiske Building, 89 State Street, Boston, Mass. (See illus., p. 234.)

* * *

No. 2001—For Sale—Naval Scout type cruiser, 57.6x11x3.6 ft. Powered with a Sterling engine, in A-1 shape throughout. Stateroom forward for two. Main cabin midships with berths for three; then a galley all the width of yacht, aft of which is engine room, crew's quarters, toilet, etc. A real seaworthy boat, not a toy, and one that could stay to sea for a week at a time without causing hardship to the occupants. Serviceable because of the economical fuel consumption, dependability and seaworthiness. Asking $8,000, will consider slightly lower offer as concession for prompt sale. Illustrated in our Booklet, free on request. G. W. Ford Yacht Agency, 30 East 42d Street, New York, N. Y.

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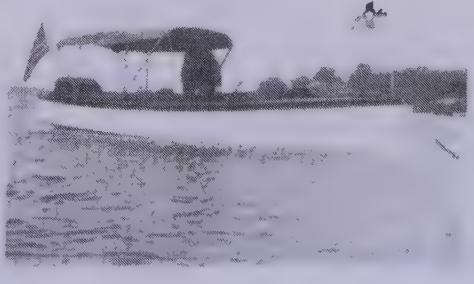
No. 15037—For Sale—41-ft. raised deck motor cruiser, 10 ft. beam, 3 ft. draught. Designed and built by Britt Brothers at West Lynn, Mass., in 1911. Very roomy cabin, 20 ft. long with 6 ft. 2 in. headroom, finished in white enamel and mahogany, 9-ft. watertight cockpit. 25-h.p., 1915, four-cylinder Loew-Victor motor, giving a speed of over 10 miles an hour. Electric lights throughout. Toilet, galley, lockers, tender, etc. Owner and wife cruised along the Maine Coast last Summer in perfect comfort. One of the most attractive motor yachts of her size on the Atlantic Coast. Bargain. Can be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange St., Boston, Mass.

* * *

No. 15012—For Sale—25-ft. motor boat, 6 ft. beam and 2 ft. draught. Designed and built by Stearns & McKay at Marblehead, Mass., in 1913. Equipped with a 7½-h.p. Mianus motor. Cedar planked and copper fastened. 15-ft. cockpit with awning on slide. Complete equipment required by Government regulations. Very easy to handle and an ideal boat for an afternoon spin. Can be purchased for the bargain price of $200. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15037



15012



15155

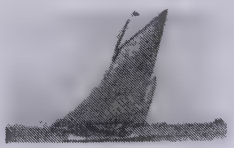
No. 15155—For Sale—Yawl, Ariel II, 38x12x3.6 ft. Designed by C. D. Mower, and built by A. A. Springsted at Canandaigua, N. Y. A splendid sea-boat, very able and fast, and an ideal cruiser. No expense was spared in building. Selected frames and planking were used in construction. Unusually well found, and one of the most roomy cruisers of her dimensions. Complete with full cruising equipment, and an excellent bargain at $1,500. For further particulars address Hollis Burgess, 15 Exchange Street, Boston, Mass., or Cox & Stevens, 15 William Street, New York City.

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No. 14770—For Sale—Hunting cabin Crosby cruiser, 34x13x3 ft. 12-h.p. Lathrop motor, new September, 1915, and very little used; cabin 6 ft. headroom, sleeping accommodations for four people, toilet and wash-bowl; speed 8 miles. A very comfortable, roomy boat, absolutely sound and tight. A first-class outfit at a reasonable price, $1,000. Oscar F. Fanning, Southampton, N. Y.

* * *

No. 15039—For Sale—Very desirable single-handed auxiliary yawl, 34 ft. o. a., 23 ft. 6 in. w. l., 10 ft. 6 in. beam and 3 ft. 8 in. draught. Outside ballast with centerboard passing through it. Large cabin with 5 ft. 11 in. headroom. Equipped with a 1916, 5-h.p. Bridgeport motor under cockpit. Sail area 615 sq. ft. Complete cruising inventory. Large ice-chest, etc. Stiff, able and very seaworthy. Bargain price of $850. May



15039

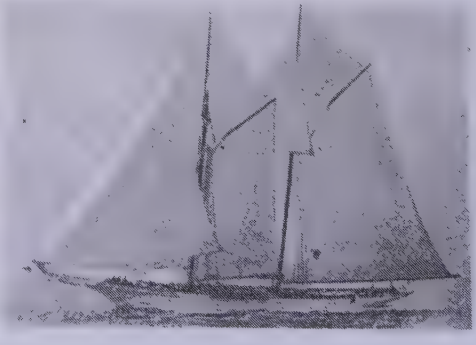
be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 148—For Sale—Steam, auxiliary schooner yacht, 130 ft. o. a., 110 ft. w. l., 26 ft. beam, 15.6 ft. draught. Built for offshore service. Speed under power 9 knots. Large saloon, five staterooms, three bathrooms; all conveniences. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York City.



14770



148



15035

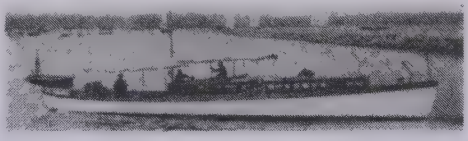
No. 15035—For Sale—Hull of [illegible]-ft. motor boat Totem. Everything complete except motor. [illegible] ft. beam, 3 ft. 10 in. draught. Designed and built by Charles F. Brown at Pulpit Harbor, Me., in 1909. Planked with 1¼-in. yellow pine and strongly constructed throughout. 20-ft. cockpit with engine bed at forward end. 25-ft. cabin with full headroom, finished in white enamel and cypress. Toilet at after end of cabin. 105-gal. gasolene tank located aft. 6,000 lb inside cement ballast. A 25-h.p. motor would give a speed of 10 miles per hour and a 100-h.p. motor should give a speed of 16 to 17 miles an hour. Splendid boat for carrying passengers on account of her long cockpit, which can accommodate at least 30 persons. High bow and raking torpedo stern, making her very extremely attractive in appearance. In rough water boat is perfectly dry. This hull has been recently overhauled and as soon as a motor is installed is ready for sea. Can be purchased at a sacrifice price. Anyone desirous of first class yacht, party boat, or small towboat, should not fail to investigate this boat. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 15042—For Sale—Twin-screw raised deck cruiser, 61 ft. 9 in. o. a., 57 ft. w. l., 11 ft. beam, 3 ft. 6 in. draught. Gross tonnage 28, net tonnage 24. Designed and built by New York Yacht, Launch and Engine Company, at Morris Heights, New York, in 1909. Equipped with two 25-h.p., each four-cylinder, 20th Century motors, recently overhauled and in perfect order. Deck dining room and saloon forward with bridge deck and steering wheel aft of it. Three berths in forecastle with crew's toilet. Three staterooms, an owner's double stateroom aft and two single rooms forward of this. Mahogany finish inside and out. 6 ft. 3 in. headroom. Electric lights. Very strongly constructed. Quartered oak decks. Has been used for Southern cruiser and has shutters and windows giving ample ventilation. 300-gal. gasolene tank. Carries a launch and dinghy on davits. 145-gal. water tank forward. Very ample deck room with space aft for deck chains. Completely equipped in every detail, searchlight, windlass, cushions, carpets, flags, dishes, cooking utensils, etc. All ready to go in commission. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 2825—For Sale at Low Figure—Day cruiser, 60x10.9x 3.3 ft. Speed 12-13 miles; 40-60-h.p., six-cylinder Standard motor.



2825

Saloon with two transoms, toilet, etc. Excellent condition. Cox & Stevens, 15 William Street, New York City.

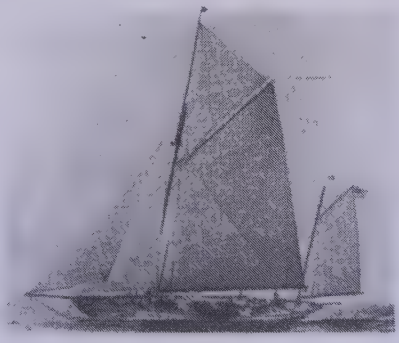
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No. 2531—For Sale—Exceptional Bargain—Most desirable flush deck, keel auxiliary of size available; 94.6 ft. o. a., 64.8 ft. w. l., 20 ft. beam, 9.6 ft. draught. Speed under power 7½ miles, 55-h.p. Sterling motor, Independent electric light plant, Ratsey sails, and complete equipment, all new 1915. Two double, one single stateroom, two bathrooms, large saloon, etc. Special opportunity. Cox & Stevens, 15 William Street, New York City.

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15042



2531

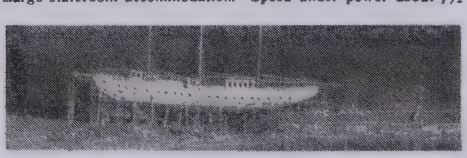


15041

No. 15041—For Sale—Very fast 27-ft. motor boat, 4 ft. 6 in. beam, 2 ft. 2 in. draught. Speed 25 miles per hour. 60-h.p. American Roadster motor, four-cylinder, four-cycle. Cedar planked and brass-screw fastened. 13-ft. cockpit, 40-gal. gasolene tank, spray hood and awning, combination cockpit cover, coil, etc. Sacrifice price $750. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 3374—For Sale—New, three-masted auxiliary schooner yacht (built for service on Alaskan Coast); 132 ft. on deck, 25 ft. beam, 14 ft. draught. Extra heavy wood construction. Large stateroom accommodation. Speed under power about 7½

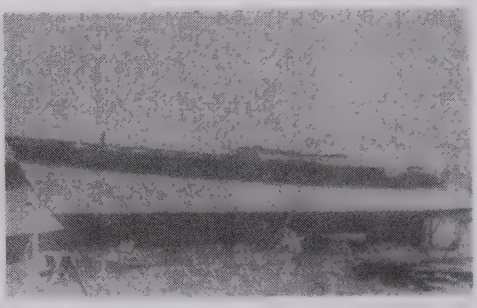


3374

miles. Ice machine, hot-water heating plant, etc. For further particulars apply to Cox & Stevens, 15 William Street, New York City.

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No. 15040—For Sale—25-ft. waterline sloop, 40 ft. 5 in. o. a., 10 ft. 6 in. beam, 4 ft. 8 in. draught. 6,000 lb of lead on keel



15036

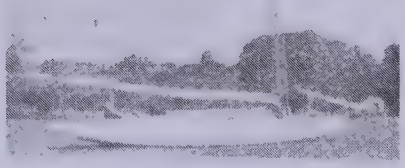
with centerboard passing through it. Designed by William H. Hand, Jr., and built by Cobb Brothers at Fall River, Mass., in 1901. Very roomy cabin with 6 ft. 2 in. headroom, finished in mahogany and oak. Four berths in cabin, toilet, berth for man forward and good galley. Sails made by Wilson & Silsby in 1915, 940 sq. ft. in area. Complete cruising equipment including tender. Splendid boat for cruising in moderate draught waters as she only draws 4 ft. 8 in. May be seen at Marblehead, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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No. 15036—For Sale—Unusual bargain at $450. Cabin motor boat, 32 ft. 8 in. long, 6 ft. beam, 2 ft. 6 in. draught. Designed and built by Cobb Brothers at Brewer, Me., in 1907. 15-ft. cabin finished in solid mahogany and white. 10-ft watertight cockpit. Equipped with a 11-h.p. Ferro motor, giving her a speed of 10 miles per hour. Electric search and side lights and dome lights in cabin. Boat has been used less than 1,200 miles. Khaki hood folding over cockpit. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

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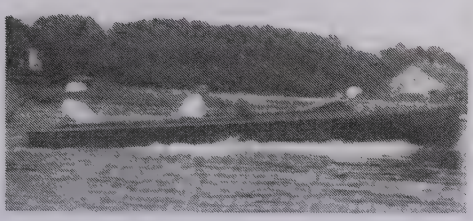
No. 14820—For Sale or Charter—32-ft. o. a., auxiliary sloop, 11 ft. 6 in. beam, 6 ft. 6 in. draught, 9 gross tons; 8 years old; Noted "Friendship" model. Trunk cabin with full headroom, built new last Spring. Interior cabin, toilet and galley, mahogany, white enamel and natural cypress finish. Main cabin has spring cushions, leather upholstery, sleeps four, two berths forward of galley. Roomy galley. Shipmate range, Perfection oil-stove, refrigerator, porcelain sink with fresh water, lots of cupboard room. Electric lights throughout. Watertight cockpit. 11-h.p. Knox engine, underneath deck control. 60-gal. gasolene tanks; 30-gal. water tank. Outside and inside ballast, two anchors, 25 fathom galvanized chain. Sails new last season. New awning. Apply to Maurice D. Towle, Belfast, Me.



15040



14820

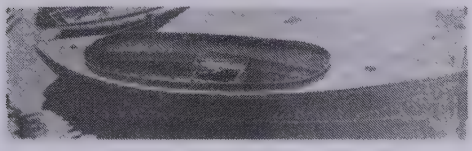


14821

No. 14821—For Sale—24 ft. by 4 ft. 6 in. by 18 in. Has made 22 knots; 35-h.p. four-cylinder, four-cycle Peerless engine, reverse gear, auto steerer, and control. Bronze rudder, shaft and propeller; copper tank and copper fastened; spray hood; full equipment. Price $300. Also: One very high-grade open runabout, only used a few times last Summer and the best of care taken. Dimensions 25x6x2, 35-h.p. Red Wing motor, four-cyl. four-cycle. Leece-Neville self-starter and generator, 24 volts. Electric lights; McClellan one-man auto top and full equipment. For full particulars, address, J. R. Peake, Larchmont, Norfolk, Va.

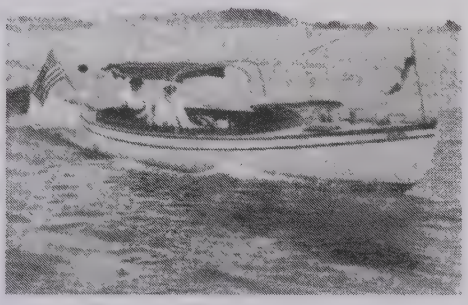
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No. 15038—For Sale—Very attractive 27-ft. motor boat, 7 ft. 6 in. beam. 2 ft. 6 in. draught. Designed and built by Ambrose Hatch at Dark Harbor, Me., in 1912. 14-ft. cockpit, comfortably seating 20 people. Equipped with a 10-h.p., two-



15038

cylinder Bridgeport motor. Exceptionally well constructed. High freeboard. Splendid rough weather boat. Splendid craft for an afternoon spin or would make a good yacht club launch. Price $600. May be seen at Buck's Harbor (South Brooksville), Me., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15046

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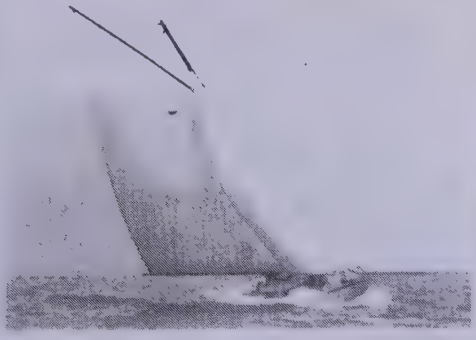
No. 15007—For Sale—Very attractive single-hander, 29 ft. 6 in. o. a., 18 ft. w. l., 7 ft. 4 in. beam and 5 ft. draught. Designed and built by David Fenton at Manchester, Mass., in 1904. Cedar planked and copper fastened. 2,000 lb of lead on keel. Watertight cockpit. Cabin sleeps two people. Wilson & Silsby sails in good condition. Good equipment. Splendid boat for boy or girl to learn to sail as she is very easy to handle and is uncapsizable. Sacrifice price of $350 takes her as owner has purchased a larger boat. May be seen in Boston, by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 15046—For Sale—Attractive open motor boat, 26 ft. 4 in. long, 7 ft. beam, 2 ft. 6 in. draught. Designed and built by Atlantic Company, at Amesbury, Mass., in 1911. Equipped with a 20-h.p. Roberts, four-cylinder, 1916 motor. Double ignition. Bosch D.V. magneto, Kingston coil, Paragon reserve gear. New English battleship linoleum on floor. New sprayhood. Splendid boat for an afternoon spin. Would make good club launch. In perfect condition. Price $550. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 3847—For Sale by an Estate—Comfortable coast steam yacht, 113x19x6 ft. Herreshoff build and design; large deck space; hall, dining saloon and galley on deck; four double, two single staterooms and two baths, etc., below; economical fuel consumption; 10-12 miles speed; reasonable price considered. For further particulars apply to Frank Bowne Jones, Agent, 29 Broadway, New York City.



15007



3847

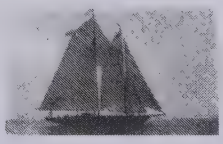


1609

No. 1609—For Sale—Auxiliary schooner, 67 ft. o. a., 46 ft. 6 in. w. l., 16 ft. 5 in. beam, 6 ft. 7 in. draught. Speed under power 5 miles; 15-h.p. Sterling motor, installed 1916. Sails, etc., in good condition. Lead ballast. Accommodations include two double and one single stateroom, large saloon, toilet room, etc. Completely equipped. Well adapted for outside cruising. In good condition throughout. Price low for quick sale. For further particulars and price apply to Cox & Stevens, 15 William Street, New York. Telephone, Broad 1375.

* * *

No. 647—For Sale—Modern, flush deck, light draught, auxiliary schooner yacht, 106x75x24.6x5.6 ft. Speed under power 9 knots. Large saloon, three staterooms, two bathrooms,



647

electric lights, hot-water heating plant, etc. Cox & Stevens, 15 William Street, New York City.

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No. 14807—For Sale—Combination keel and centerboard sloop, 32 ft. o. a., 9 ft. beam, 3 ft. 7 in. draught, with board



14807



14819

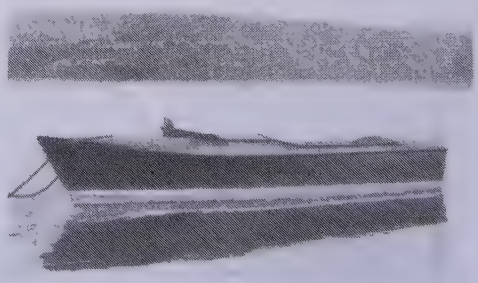
up. Built by Huckins, 3,500 lb outside lead, centerboard passes through lead. Challenge steering gear with brass and mahogany wheel with rosewood handles. Sails, spars and rigging all complete and in first-class condition. An ideal day sailer, easily handled, very fast and non-capsizable. A consistent prize winner and winner of several championships. Will be sold at a bargain as owner has larger boat. Apply to R. J. Murphy, 645 Fifth Street, So. Boston, Mass.

* * *

No. 14819—For Sale—Myrtle, ex-Idlewild, cabin cruiser, 48 ft. by 10 ft. by 3½ ft. draught, Murray & Tregurtha, builders; Murray & Tregurtha engine. Mahogany finish interior. Construction first-class in every respect. Fresh water two places. Engine two-cylinder 6½ by 9. Price $1,800 for immediate sale. This boat is complete in every detail. Can be seen at Neponset, Mass. In perfect running order, and under cover for Winter. Will deliver at reasonable distance for cost of trip. Apply of owner, Arthur L. Barr, 14 Oxford St., Boston, Mass.

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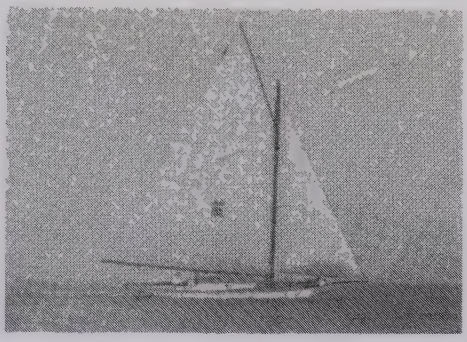
No. 14814—For Sale—16-mile, stepless V-hydroplane runabout, used one week. Carry five in cockpit, 15 ft. o. a. Full decked over motor, Pantasote cushions, Waterman two-cylinder, 4x4, copper jacket, aluminum base motor, weighs 140 lb. Has more power than wheel can use, would make better time with larger blade area. Columbian bronze rudder, bronze self-aligning strut, bronze shaft log with self-aligning stuffing-box. Universal joint aft reverse gear with thrust bearing aft joint. Copper tanks under stern deck with Stewart-Warner vacuum pump gasolene feed. Maxim silencer, rear starter. Boat built by days' labor of selected white oak and cedar, brass-screw fastened and plugged. Hull capable of making almost unlimited speed with large power. Selling at much less than half-value as owner has no time to use. F. B. Weller, 239 W. 103d Street, New York City.



14814



1312



15044

No. 1312—For Sale or Charter—Very roomy, able auxiliary ketch; 97 ft. o. a., 76 ft. w. l., 20 ft. beam, 4.6 ft. draught. Built 1910. Flush deck; large cockpit. Exceptional accommodation; main saloon, four staterooms, two bathrooms, etc. Ratsey sails. Speed under power 7-8 miles. In commission. Cox & Stevens, 15 William Street, New York City.

* * *

No. 2547—For Sale or Charter—Attractive gasolene cruiser; 64x12.6x4 ft. Built 1913. Speed 11-12 miles. Best construction. Main saloon and toilet room forward; two staterooms,



2547

bathroom, etc., aft. Price low for immediate disposal. Cox & Stevens, 15 William Street, New York City.

* * *

No. 15045—For Sale—28-ft. motor boat, 5 ft. 7 in. beam and 10 in. draught. Built for Mr. George Gould as a tender for a steam yacht by Courtney and Birkett at Sussex, England. Mahogany and teak throughout. Equipped with a 1914 Model B Sterling motor, 20-35-h.p., four-cylinder, four-cycle, which drives her at 16 miles per hour. Two gasolene tanks, capacity 25-gals. Completely equipped as per Government regulations. Double cockpit; decked forward; automobile top. Can be purchased for the value of the motor, $450. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 15044—For Sale—Well-known sloop yacht Virginia, formerly Nike. Designed by Nathaniel G. Herreshoff and built by Herreshoff Manufacturing Co. at Bristol, R. I. 41 ft. 5 in. o. a., 25 ft. w. l., 10 ft. beam, 6 ft. 5 in. draught. Beautifully constructed with double mahogany planking, copper fastenings, canvas deck, etc. 8,000 lb lead on keel. Watertight cockpit 9 ft. long. Large cabin which can comfortably accommodate six persons, with 5 ft. 6 in. headroom. Sails made by Cousens & Pratt, 1,027 sq. ft. in area. Hollow spars. A noted prize winner and a splendid cruising boat. May be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.

* * *

No. 15043—For Sale—Raised deck motor boat, 41 ft. 6 in. long, 10 ft. beam, 3 ft. draught. Designed and built by Shaw at Neponset, Mass., in 1912. Roomy cabin 13 ft. long with 6 ft. 3 in. headroom finished in mahogany. Four set berths in cabin. 30-h.p., four-cylinder Peerless motor, new 1917, giving speed of 10 miles an hour. Toilet, galley, stove, sink, ice-chest, etc. 150-gal. gasolene tank, 25-gal. water tank. Watertight cockpit 10 ft. long. Complete equipment including tender. Very high-sided, roomy and seaworthy. May be seen near Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



15045



15043

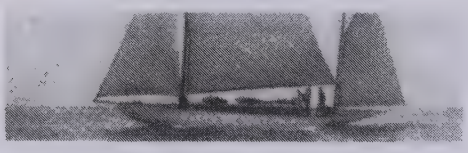


374

No. 374—For Sale—33x7x5.4 ft. Accommodates three persons. This boat is double-planked Spanish cedar inside and mahogany outside. All hollow spars. Sails in very good condition, as is also the Standard rigging, running rigging new 1915. Boat in excellent condition and very well equipped. Owner has just had her overhauled and has always taken the best of care of her. Very able and fast, having won 11 out of 14 races. Harry W. Sanford, 500 Fifth Avenue, New York City.

* * *

No. 1786—For Sale at Low Figure—Auxiliary yawl: 55x35x 14x5.6 ft. Speed 6 miles; 12-h.p. motor. Two staterooms,



1786

saloon, toilet, etc. In good condition. Cox & Stevens, 15 William Street, New York City.

* * *

No. 12231—For Sale—Modern Lawley centerboard and keel



169

cruising knockabout, 33 ft. o. a., 22 ft. w. l., 8½ ft. beam, 3½ ft. draught. New cabin, 1911; two berths; good headroom. Finished in white and mahogany. 3,500 lb lead ballast on keel. Completely furnished for living aboard, including tender, stove, dishes, etc. Whole outfit in first-class condition and will be sold at low price. Address Stanley M. Seaman, 220 Broadway, New York City.

* * *

No. 169—For Sale—$1,100. This splendid 26-ft. waterline auxiliary yawl, 37 ft. o. a., 11.6 ft. beam, 3.8 ft. draught, centerboard and keel, strongly constructed, copper fastened; beautifully finished cabin in mahogany with 5.10 ft. headroom, sleeping six persons comfortably; toilet room, 60-gal. water tank, 100-lb ice-chest, two suits of sails, lead inside ballast, iron outside, Sagamore motor, tender and full equipment. Exceptional opportunity to secure a staunch and very able cruiser, easily handled by one man and in absolutely perfect condition. No other like her. Apply to Boston Yacht Agency, 15 School Street, Boston, Mass.

* * *

No. 14812—For Sale—Raceabout Primrose, 21 ft. w. l., 33 ft. o. a., 8½ ft. beam, 5½ ft. draught. Extra large cabin, full headroom, enclosed toilet. Full cruising equipment, everything first-class. This is an exceptionally fast and able boat, has always had the best of care and can be easily handled by one man. Owner cannot use it and will sacrifice for $600. Hauled out near Boston. C. F. Macdonald, 288 Boylston Street, Boston, Mass.



12231



14812

The Annual Show of Boats and Engines

THE thirteenth annual Power-Boat Show which opened in the Grand Central Palace on January 27th, under the auspices of the National Association of Engine and Boat Manufacturers, was most successful in every way. It remained open until the following Saturday night and the attendance was much larger than at former shows. Some exhibitors doubted this but the box office figures showed conclusively that the receipts at that point were larger than last year. This too in spite of the inclement weather, snow, rain and cold which kept some, who would have attended, at home.

One exhibitor remarked that he liked this annual exhibition because it reminded him of Class Day at College when graduates met again and revived old memories. In many ways this was true of the power-boat show because nearly all the members of the association call each other by their first names and many of them meeting only once a year. Many who were not exhibitors this year attended the show and among these were Percy C. Jones, whose Ralaco engine was missed this year; Rufus K. Schriber, of the H. C. Doman Company; C. L. Snyder, of the Wolverine Motor Works; John A. Murray, of Murray & Tregurtha; James Craig; H. S. Erd, of the Erd Motor Company; Albert E. Eldredge, of the Mason Machine Works, and many others. The general excuse given for not exhibiting was "too busy" and that seemed to be the way with all, exhibitors and non-exhibitors.

Among others noticed at the show were Wilbur Young, Oscar Chellbourg, Harry Stephenson, E. P. Sand, J. H. Leonard, Fred Nock, Commodore Arthur Curtiss James, J. A. Barnard, W. Butler Duncan, Orson D. Munn, A. Loring Swasey, Charles D. Mower, Thomas Bowes, E. A. Riotte, of the Standard Motor Construction Company, Lewis Nixon, Capt. T. R. Webber and of course all the exhibitors.

To enumerate all would take lots of space. Those who did visit the show were however much impressed with what they saw and many who had waited until now in order to see the new boats and new engines placed orders.

There were 59 boats on exhibition and these varied from the small dinghy to the 60-foot patrol boat equipped with rapid fire guns. The total value of these boats was $175,975. The total value of the engines on exhibition was $179,807. The boats and engines were on the main floor and the total value of the exhibits on that floor was $356,782. On the mezzanine floor the Sperry exhibit of gyroscope compasses, stabilizers and the Sperry Beam was worth more than $50,000 and the other exhibits on that floor easily put the total value to close to the half-million-dollar mark.

The one missing feature of the show was the absence of the Diesel or heavy-oil engine. The Nelseco Company had a space but nothing was on exhibition. This was disappointing to many, because the heavy-oil engine is attracting more attention every year and many who visited the show asked where they were to be seen.

On Thursday, February 1st, the annual meeting of the National Association of Engine and Boat Manufacturers was held in the Engineering Societies Building. The reports of the officers and committees showed that the association was flourishing.

A luncheon followed the annual meeting, after which the defense problems were discussed. All declared themselves ready and willing to help the Government in every possible way. James Craig started the enthusiasm. He said:

Fellow workers, we are confronted this morning with a condition that is inconceivable, and the possibilities and the dangers that confront us we can only just think of. In connection with those possibilities it comes to my mind that we men who have been engaged in the power-boat business, making power boats of various sizes, have been laying up a latent force that will be a Godsend to this country should she be required to go into war with any foreign Power. (Applause.) I know absolutely from experiences that have come to my knowledge that we men will serve the Government when she requires it to a degree of efficiency and service that will be beyond what the Navy Department now has in hand. We will be prepared to produce, and can produce, a fleet of tormentors that will be the salvation of the country, and the methods that we can use in preparing those tormentors will be a revelation to you. You will wake up, and you will wonder how it was done. I now hand this matter over to my friend, Mr. Sutphen, who will tell you of some things he has done—the most glorious in the land!



Miss Minneapolis. The First Mile-a-Minute Boat

Henry R. Sutphen first proposed a toast to the President of the United States and to our Country. The toast was drunk in silence, all standing, after which Mr. Sutphen said:

We are living in most unusual times, and what will come tomorrow nobody knows. Whether war has been declared today by our Congress, we don't know; but there is one thing, as Mr. Craig says, that when it is a matter of war, the country is one, fighting for one principle and one end. I believe that the one thing above all others that the warring nations took into little account when they went into this great conflict in Europe was the internal-combustion engine. The aeroplane had been developed in a small way, and had been given up as a sporting proposition, not worth while. The submarine dates back much further than the aeroplane. It was laughed at by the great navies of the world. The naval officers preferred the battleship wardroom and the messroom conveniences to the submarine. As the war progressed, the various nations began to look into the internal-combustion engine, and they saw more and more the great possibilities of the aeroplane and submarine. It was brought to my attention by a very prominent Englishman in the early part of 1915, that they were looking for something new. We are all interested in marine matters, my work is in that direction, and I said: "Well, you may have trouble from the submarine. It is an unknown quantity, and you have got to get ready to combat it." He said, "Well, how would you do it?" Well, as we are in the business of building submarines, we know their limitations, we know the thing that troubles the submarine commander more than any other thing, and I told him that, in our experience, the one thing that could possibly be of use was some form of surface vessel. He said: "What would that form be, how large a boat?" I told him that a boat from 75 to 80 feet, with a speed of 19 to 20 knots, if built in quantities, would prove of tremendous benefit and assistance in counteracting the submarine menace, which, at that time, in the early part of 1915, was still unknown. They knew what the enemy had previous to the war, and they didn't think the enemy ever could bother them very much with the submarine. But, this man had the imagination, and he saw at once that there was something in the idea. He turned to me and he said: "That is all right, but do you mean in large numbers?" I said yes, and he asked, "How many could we get?" Well, if any of you had been asked at that time how many 80-foot power boats anybody could get in one place quickly, I think you would have said as I did, two or three, or four or five. He dismissed it as not worth while. He said, however, "Think it over, and see if you can't scheme some way of getting more." I thought it over three or four days, and I told this gentleman that under great stress, using my imagination to the limit, I could conceive that fifty boats could be built in a year and a half. He said, "Well, that is worth while offering," and he offered it to his Government. They accepted it within a week, and then I had a job, a man's job, all right. Within two months of that date, I was asked to give them five hundred more, and to cut my deliveries down so they could get them all within a reasonable length of time. I was also able to conceive of offering them the 550 within a period of sixteen to eighteen months. We built those 550 boats in less than 550 days from the signing of the first contract, and we delivered them ahead of time.

Now, the resources of our business are, in my opinion, tremendous. As Mr. Craig says, it is a latent power that has been built up in the years that we have struggled in this little business. If it is once allowed to expand, it will revolutionize surface boats of every kind and description. The great idea is just what we have had the foresight to see, and that is standardization. I appreciate fully what Mr. Barnard is trying to do, and what our Navy Department is trying to do, you might say, in times of peace, stimulate interest. I want to tell you that England did not do this, although she did in our great international races which we ran years ago, and which we all looked at from a distance, sometimes from the inside, with many disappointments and many laughs and jokes about the failure of this fellow and that—England behind the scene, the British Admiralty, was supporting and encouraging the Royal Yacht Club and the British Motor Yacht Club, unknown to the yachtsmen in England; and by so doing they developed the men for patrol boat service. Today there are 6,000 to 8,000 men in England serving in power launches, and they depend on those boats for guarding British waters immediately around the British Isles, and in distant parts of their possessions.

Standardization was one thing that made it possible to do what we did. If the boats had been stretched along on one line they would have reached over eight miles. 275,000 h.p. of gasolene engines were used to develop the power required to drive the boats and throughout the entire building period not a boat was lost, not an accident occurred. Not an engine broke down, not a crank shaft, not a propeller, not a connecting rod, not a cylinder was broken, and yet every boat went through a trial.

In England they said an 80-foot power boat in the English Channel and the North Sea would be absolutely a joke, that they could not withstand the seas, that they could not live in them, and the men could not stand it, and they would be of no use. Well, that was the impression of the men before manning these boats; but they were at war, and they rose to the occasion: it was either serve the country in a power launch or serve in a trench, and those who had the red blood in their veins to follow the sea chose the power launch, and today they are serving their country under difficult circumstances and running tremendous risks. To my mind the effort was as radical as was the Zeppelins when they were first introduced in Germany. The power cruisers go out for ten days at a stretch before they come into port, and they are the only hope that they have for immediate use around their waters for counteracting the submarine menace. A submarine cannot fight a submarine. We all know that is impossible, and the only possible way of attacking a submarine is by taking the last location where it was, and surrounding it with a large quantity of boats radiating like the spokes of a wheel, covering the area, until the submarine rises to the surface; and the submarine commander today fears most the power boat on the surface.

Now, we are in the midst of strenuous times for our country. It may be that tomorrow we will have a call to serve, or next week or next month, and as I stated before, the internal-combustion engine has been reckoned here, as far as power boats are concerned, much more than in any other part of the world, and we want to do everything in our power to help our Government, and to encourage them to recognize in Congress the great importance of the power boat in defense of the country. While it is true that we are 3,000 miles away, the submarine of an enemy can be brought right to our shores without any difficulty whatever, and I fear it is going to be, and it is up to us, with all the energy and the imagination and the resources that we have, as engineers and men of business in the power-boat field, to do our part when it comes; and do not forget that each one can do his bit, and if we all combine together in doing our bit, we can win. (Applause.)

Chris. C. Smith, builder of Miss Minneapolis and other fast boats, said:

When I was here in 1914, I said that it looked to me as if our coast defense depended on the small boats. I know very little about a torpedo, and less about a cannon, but there isn't anybody who can get behind a gun and shoot it faster than I could when I was at the game. It looks as if a boat 65 or 70 feet long, that can be driven 40 miles an hour, and carry a torpedo tube, and one or two rapid fire guns, and built substantially, so that it will stand up for a great many years, could be turned loose on battleships. I have been informed that battleships cost from $12,000,000 to $15,000,000. It looks to me as if such a boat could be built by some one who is properly equipped at a cost of about $30,000, possibly more, with a reasonable margin of profit. This Government would be able to build 400 or 500 of these boats for what one battleship would cost. The way it looks to me is this, it is like setting a nest of hornets at the bull. Some of the hornets will get to the bull, but the bull won't get the hornets. The battleships, in order to do any effective work, would have to be anchored within twenty miles of the coast, we will say 40 minutes' run with a fleet of these boats, coming from five or six different ways, and driving at that velocity, it looks to me as if it would be very difficult to train a gun on them, and some of them could go almost up and poke a torpedo into that ship. That looks to me like a real coast defense. I haven't anything to sell, but I would be glad to give anyone who wants to go into it my views on the subject. I have seen boats over here, and it seems to me as if the installation of the engines is absolutely wrong. I am not knocking, but I don't think you see the boat in the right light, nor the installation in the right light. I would be glad to go over it with anybody and show him my views, not that I want to make money out of it, money is no good to me, I have lived to an age where I can't use it if I had it.

J. H. Barnard, secretary of the Power Craft Association, and representing the Navy Department, said:

Mr. Smith proposes large numbers of fast boats, and he likens a battleship to a boat. Everyone of those fast boats that you gentlemen build, you must get somebody to run. You don't find somebody who can run them every day of the year. You have got to train men to run them. Spend a little time on a destroyer, and see them jammed through open waters at the speed they make, and you will know it is no boyish play. These boats which you gentlemen are building would have to be driven around these harbors at night, and in fog—that is when you work. You have got to develop the men to use those boats. The Department wants to get the men. They have laid down certain specifications of boats which they will consider. They have four classes: 40 to 60 feet, fast, making 20 miles an hour; 40 to 60 feet, making 7 knots; 60 feet and up making high speed; 60 feet and up making 10 or 12 knots. Each of these boats in itself is not of so very great value, but they give training for the men, so that in time of war the Government can build hundreds and thousands of these boats if they have the men to put on them. There are uses for boats of even slow speed.

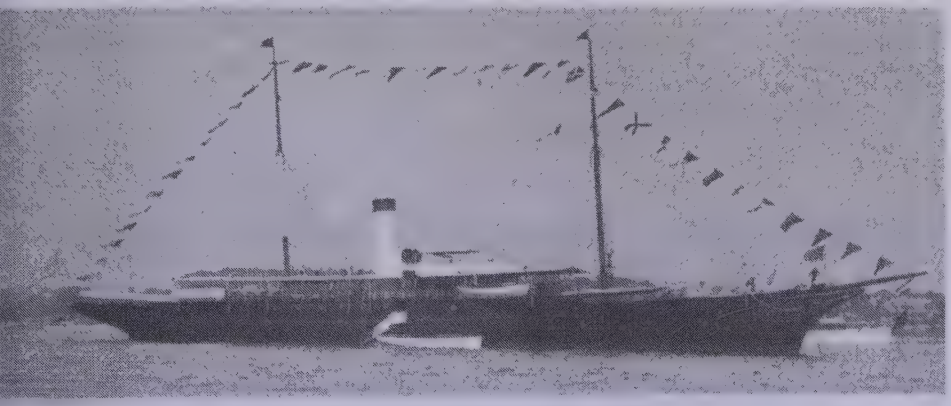
I cannot imagine a boat better adapted for planting mines, and sweeping for mines than the boats that do the oyster dredging up and down Long Island Sound, with their winches and booms. The Moss Bunkers would make a splendid vessel for all kinds of purposes in this coast defense. The defense of the coast of England, I am told, is so largely dependent today upon the trawlers of the North Sea, and upon the yachts of England, and upon the yacht owners of England, that the story has not yet been written, and will not be written for a good many years. It is not a theory that confronts us today—you have only got to read the papers. The Department goes much further than anything I have time to tell you now; but I want to say that they are prepared to enroll today any one of you gentlemen, possibly all of you, anyone who has any special skill which would be of use to the Navy Department in time of war.

We are prepared to take in everybody in the mechanical arts. There is no use in taking a fine lathe man and putting him out in the trenches, and giving him a rifle when he couldn't hit a flock of barns, and there is no use of taking a man off the streets and putting him in to run one of your lathes. If you were to get statistics of the armies in Europe today you would find that there are not 50% actually toting a gun. They are automobile drivers, telephone linemen, electricians, all sorts of special trades, and they are doing just as much for the countries for which they are fighting as the man who carries the gun. It is not a matter of whether you expose yourself to danger as to how well you defend your country; you are defending your country just as well in your shops turning out munitions. Look at Russia. In the last two years she has sacrificed millions of men because they did not have the munitions to put into the hands of those men. They were going into these trenches without a gun in their hands, and when somebody was killed alongside he would grab that gun. Many went in without a gun, and many were slaughtered. You want protection for the men, as much as you want the men behind the gun. The Department is very broad in its ideas on this matter of enrollment. If there is a good latheman he can be enrolled as a machinist, or under some such classification as that, and he can do his duty right at home, and in time of war he can continue to do that duty, and nobody can call him a slacker. Every one of you gentlemen here has some specialty. You are shop superintendents, you are gas engineers, hull designers, all kinds of things, and the Department needs you, and needs you in your specific duties, and you are doing more good there than being caught by some enlisting sergeant on the street and chased off into the trenches.

What Mr. Sutphen has just said gives me courage to rise here in a meeting of which I am not a member, to make a request of you. That is, that you will, among your Association, appoint a committee to assist the committee of the Power Craft Association of the Third Naval District in certain matters which they are taking up before the committees of the House and Senate. It might be of very considerable moment, the various things you might do, things that right at this point you may do. The officers of that body are Mr. Arthur Curtiss James, president; August Belmont, Jr., vice-president. On the Executive Committee, Mr. Dyer, Ralph Pulitzer, Harold I. Pratt, and others, all of them active men. I have had them on the telephone this morning, and they are just back from the Department, with an expression of the Department's willingness that they should go before the committees to straighten out two or three little things, so that the members of this Power Craft Association may lead the way in the matter of enrollment. I was told today that our people are holding aloof from enrollment, simply for the reason that they feel that they are doing a public good by holding aloof, because they have had experience. They know just how these things are done in Congress, and they will be followed by plenty of others, those who know. And, when it gets down to a question of commercialism, it will be worth your while.

President Amory, in adjoining the meeting, said:

I believe that we owe a vote of thanks for this lesson in efficiency that Mr. Sutphen has given us. It shows that in an emergency the Yankee is Johnny-on-the-spot.



S. Y. Diana, O. Ledyard Blair, Owner. Designed by the Late Geo. L. Watson and Built by Napier, Shanks & Bell, at Glasgow, Scotland, in 1896. 254 Ft. O. A., 216 Ft. W. L., 27.9 Ft. Breadth and 16 Ft. Draught

Boats on Exhibition

WHILE it seems human nature to go to extremes, it was worthy of note that of all the boats at the show only one was of truly warlike appearance. Notwithstanding that preparedness is the watchword, the majority of builders have come to the realization that the ideal boat, even for scout patrol work, is one that can be used for pleasure purposes most of the time but in an emergency can readily be converted for war service rather than the other way around.

The Chingachgook, while it might be used as a cruiser, could not compare as such with the Speedway, Elco and some of the other boats, and yet the latter, even after conversion, would be much more comfortable even as a war vessel.

One of the benefits of a show of this sort is that it gives the average man a chance to see at close range all of the latest improvements brought out by the builders, and without doubt it has a very large influence upon his selection of a new boat or in the alteration of an old one.

There were boats for every purpose from the big cruisers down to the flat-bottom skiffs and dories suitable for outboard engines, and a brief description of them follows:

At Lawley's space one of their stock 25-foot mahogany runabouts was the principal attraction. Like all of their products, there was a certain simplicity about this boat which might escape the unobserving but to the initiated it spelt a richness which but few builders attain. The lines were exceedingly graceful and the workmanship up to their high standard. This boat is double planked, 5/16-inch cedar inside and the same thickness of mahogany for the outer planking. Equipped with a 50-h.p. 4⅜ by 5½-inch Sterling engine, a speed of 23 miles an hour is guaranteed.

One feature about her that was out of the ordinary was the arrangement of the windshield, which is mounted on the companionway hatch. Even when the hatch is open to get at the engine, this protects the latter from any flying spray.

A 20-foot cedar yacht tender, with mahogany trim, for the steam yacht Levanter, with a Sterling Kid engine, an 11-foot mahogany-trimmed cedar yacht tender and a model, made by Boucher, of the Swasey-designed 45-foot patrol boat for the U. S. Navy which Lawley is building, completed this exhibit.

The 50-foot Elco cruiser was one of the biggest boats at the show. This is a development and enlargement of their popular 45-footer and is essentially a comfortable cruising boat with moderate speed. The owner's stateroom contains a double berth, a transom berth, separate toilet, three large lockers, large bureau, etc. The saloon forward contains four bunks, an upper and a lower on each side, buffets, china closets, lockers, racks, etc., with a toilet off the companionway landing. Forward of the saloon is an unusually large and well-equipped galley. The engine, a four-cylinder, 6½ by 8-inch 60-h.p. Standard, capable of driving the boat 13 miles an hour, is in an entirely separate compartment, amidships under the bridge deck, and comfortable quarters are arranged here for the engineer also.

The well-known Cruisette as usual came in for a large share of favorable comment. It was practically the only cruising boat in the show suitable for the average yachtsman. Of the trunk cabin type, with the engine installed as far aft as possible and entirely separated from the main cabin by the cockpit—really comfortable cruising accommodations for a 32-footer—it is an ideal boat for day sailing, fishing or cruising for a small party.

Two Elco expresses were also on exhibition, a 32-foot V-bottom boat, a new model for the company, and equipped with a 115-h.p. Elco engine, which gives her a speed of 30 miles an hour, and the regular 36-foot round-bottom stock model boat of this type, in which was installed a 100-h.p. six-cylinder engine, 26 miles an hour being the guaranteed speed for this boat. A feature of the V-bottom boat was the disappearing cockpit, which is located forward of the engine. When open there is no coaming around this cockpit, which is fitted with a regular latticed seat with a straight back. To close it up the back of the seat swings up on travelers and what was the back is really a deck finished the same as the rest, and when this is swung home makes a watertight hatch flush with the surrounding deck. Both of these boats were fitted throughout with Elco hardware, etc.

The Chingachgook, exhibited by the Greenport Basin & Construction Company, is so well known to our readers that she needs but little description. Sixty feet long, of the V-bottom type, with two guns mounted on deck, the steel shelter of the helmsman, and the whole painted a dull gray, she was a constant reminder of the great conflict going on in Europe. She is a duplicate of the patrol boats built by this concern for the Russian Government, only, instead of having three engines as they had, two 200-h.p. eight-cylinder Sterling Navy-type engines were installed.

This company also showed a 26-foot limousine owner's yacht tender, equipped with a 25-h.p. Wisconsin engine and capable of 16 miles an hour; a 12-foot yacht tender and a 9-foot yacht tender, both the latter being finished bright.

The Toppan Boat Company had seven of their popular products on exhibition, a 22-foot dory launch, equipped with a 9-12-h.p. Universal engine, and fitted with a spray hood forward; a 14-foot V-bottom runabout with a 12-h.p. Universal; an 18-foot Swampscott with a 3-h.p. Palmer engine installed in a cuddy hatch aft; a 16-foot Sportsman's dory, also with a 3-h.p. Palmer; a 15-foot dory, specially designed with a wide stern for an outboard engine; a 10-foot dory skiff and an 18-foot Club sailing dory, fully rigged, similar to those which have appeared in THE RUDDER from time to time.

The 52-footer shown by the Gas Engine & Power Company and Chas. L. Seabury, Consolidated, was the second largest boat in the show. There is always a character to the Speedway boats that makes them stand out in any company, and this boat is similar to all the others. While instead of trying to make it look like a naval craft

in the first place, it follows the conventional type, but provision has been made to convert it into a patrol boat with very little trouble.

Forward under the raised deck is a stateroom with two berths, off of which is a separate toilet room. The gasolene tanks are under the bridge deck, completely bulkheaded off, and the engine room is just aft. A part of the main cabin is carried over the engine room, giving full headroom and ventilation.

In it is installed a Model M, 75-130-h.p. six-cylinder Speedway engine, and above the transoms on each side are pipe berths for the crew, also a folding lavatory and a toilet. The galley is at the forward end of the main cabin and is equipped in the usual thorough manner, including the Speedway alcohol range. On the starboard side is a large toilet with linen lockers, medicine cabinet, etc. The after cabin is fitted with what appear to be the usual transoms but which, by sliding out the seat and dropping down the back, make full-width berths. With the engine installed 16 miles an hour is obtained, while if a pair of the same model were used with twin screws, a speed of 21 miles is guaranteed.

The four other Speedway boats were a 35-foot by 6-foot 6-inch "Coupe" type tender for the Isabel, John N. Willys's new yacht. It is powered with a 60-80-h.p. Model C, six-cylinder Speedway, which gives her a speed of 20 miles. The helmsman is in a separate cockpit, forward of the engine, and the main cockpit is aft, exclusively for passengers, with a permanent top over the forward part; a 35-footer, Billy Bing, all-mahogany runabout with a 130-150-h.p. Model M Speedway; a 30-foot mahogany runabout with a 35-44-h.p. Model Z Speedway capable of 19 miles an hour, and the Speedway Jr., yacht tender, with a 12-15-h.p. four-cycle Gray engine.

The Mianus Motor Works exhibited a 25-foot lifeboat, equipped with a two-cylinder, two-cycle, 10-h.p. Mianus engine, turning a 21-inch propeller 500 r.p.m. This boat is 8 feet breadth and of 408 cubic feet capacity, and was built by the Astoria Boat Works, according to plans and specifications approved by the Board of Supervising Inspectors of the U. S. Steamboat Inspection Service. It will safely carry thirty-four people and the exhaust is fitted with a non-returnable valve to keep water out in a rough sea.

The Wisconsin Motor Company had a 28-foot by 5-foot 8-inch mahogany V-bottom runabout, built by Hubert S. Johnson, equipped with a 5½ by 7-inch, 90-120-h.p. Wisconsin, which drives the boat at the rate of 30 miles an hour. This boat was designed by L. M. Fenner, of the New York office of the Wisconsin Company, and is of the concave V-type and with her flaring bow and slightly hogged sheer has a decidedly speedy appearance.

The Joanna, a 40-foot mahogany express cruiser built by the Albany Boat Corporation, is, as the term implies, for day sailing and racing primarily and the cruising accommodations are forward under the raised deck. They consist of a comfortable cabin, with separate toilet and stowage space forward and a full-width galley at the foot of the companionway landing. The engine is under a short trunk cabin, aft of the bridge deck. This is a six-cylinder, 6¾ by 7¼-inch, 250-300-h.p. Duesenberg and the guaranteed speed of the boat is 30 miles an hour. This boat is of the concave V-bottom type with the chimes very straight and full forward. It is a stock model, but there are four different arrangements worked out by the builders to suit the individual requirements.

The other boat shown by this company was a stock 30-foot by 6-foot 6-inch mahogany runabout of the concave V type equipped with a 100-h.p. six-cylinder Sterling engine, with which a speed of 35 miles an hour is guaranteed.

The two boats shown by the Niagara Motor Boat Company were both of the runabout type. The larger of the two, a 32-foot V-bottom boat, is a new departure for this company, as in the past they have followed the round-bottom displacement type closely. This boat has a breadth of 6 feet and is powered with a Model F, 5½ by 6¼-inch Sterling engine and makes 27 miles an hour. The second boat is a 28-footer, round-bottom type similar to that standardized by this company, and in the general arrangement was like the 32-footer. The engine, a 20-35-h.p. 4⅜ by 5½-inch Sterling, gives the boat a speed of 18 miles.

Of the eight boats shown by the Cape Cod Power Dory Company, the new 21-foot family runabout with a Sterling Kid engine attracted the most attention. A round-bottom boat of conventional lines, the striking feature was the cockpit arrangement. There was a thwartship seat across the after end of the cockpit. All the other seats are individual with folding backs and cushion life-preservers. The engine is housed over and to star-



U. S. Navy Power Torpedo Boat, Built by the Greenport Basin & Const. Co. Power Two 300-400-H.P. Duesenberg Engines. Speed on Trial 40.4 Miles per Hour

board is a box containing storage battery, etc., and the after side of this forms the steering bulkhead with automobile type steering wheel, controls, etc. The Sterling engine drives her 14 miles an hour.

The 17-foot launch resembled her larger sister in looks and arrangement but was equipped with a 5-h.p., two-cylinder Palmer engine, also under a housing in the middle of the boat. A Cape Cod power dory, 20 feet long and equipped with a 3½-h.p. Palmer in a cuddy hatch aft, and the flat-bottomed lake and river model, 16 feet long with a 2½-h.p. Palmer, appealed very strongly to the man with a limited purse.

Three rowing skiffs, a 10, a 12 and a 14-footer, and a 17-foot decked sailing dory completed this exhibit.

The Great Lakes Boat Building Corporation exhibited one of their stock 50-foot military type express cruisers similar to the many which have been published from time to time in THE RUDDER and are familiar to all of our readers. Of the V-bottom type, they are extremely fast and yet have good cruising accommodations. The eight-cylinder, 6 by 6-inch Model J Van Blerck is installed under the bridge deck, dividing the accommodations into two parts. The forward quarters, under the bridge deck, consist of a full-width galley, with sink, alcohol range, etc., and a large cabin sleeping four persons comfortably, lockers, mahogany dresser, folding lavatory, etc.

The after cabin has a large toilet room on one side forward with a large clothes closet opposite. Next there are buffets on each side and then the transoms, which are arranged so that by pulling them out and dropping down the backs two wide berths are formed. Then comes a comfortable cockpit the full width of the boat. The engine controls are led to and mounted on a mahogany column on the bridge deck, which also carries the steering wheel.

The 36 by 7-foot shelter cabin launch exhibited by the Luders Marine Construction Company was perhaps the most originally arranged boat in the show. The model is of the concave or wave-collecting type, refined to the limit. Under the raised deck forward is a small cabin with storage and toilet facilities but no sleeping accommodations, as it is purely a day boat. Then comes the bridge deck with steering and engine controls on the port side and a clear passage on the starboard side to the after cockpit. Immediately aft of the bridge is a narrow trunk cabin housing the engine, with a passage also on the port side, and by removing the sides of this trunk all parts of the engine are accessible. A stack over this compartment affords ventilation and adds to the snappy look of the boat. Aft is a generous cockpit with a shelter cabin at the forward end. The engine, an eight-cylinder, 5½ by 6-inch Van Blerck, drives the boat at a speed of 30 miles an hour.

Luders also had a model, by Boucher, of the 66-foot scout boat built by this company for the U. S. Navy, and a bright-finished lap-strake tender.

Fay & Bowen's feature was the 30 by 5-foot raised deck runabout of conventional design and arrangement with one of their six-cylinder, 50-h.p. engines under the forward deck. While there was nothing out of the ordinary, everything was worked out so nicely that the whole was a very harmonious job. This boat is capable of 20 miles with the power installed.

The 26-foot "Family" runabout was all that its name implied and is a fine all-around type of round-bottom boat. With a 22-h.p. Fay & Bowen it is capable of 14 miles an hour. The third boat, the Junior runabout, is 24 feet long by 4 feet breadth and was designed by Morris Whitaker. In arrangement she is almost identical with the 30-footer, on a reduced scale, and a 22-h.p. 3½ by 5-inch Fay & Bowen drives her at 16 miles an hour.

Miss Minneapolis, which has received more publicity than any other boat in the show, was exhibited and made a strong appeal to the speed-boat enthusiasts. She has been described so often that there is little more that can be said about her except that, good as she is, Chris Smith will probably bring out another boat to beat her.

The Welin Marine Equipment Company have always had something out of the ordinary, and this year, instead of having a complete boat, they had a section of one, built of steel, showing their new method of construction. Steel boats are rather new in this country, in smaller sizes, but this company has built several, and they have been so successful that it seems only a question of time before we will be having popular types built of metal. The advantages are many, among the principal ones being the freedom from fire risk, for it is possible to build an engine room in which there is not a single piece of wood, and also make it so that even should loose gasolene catch fire it can be confined to this space without danger to the rest of the boat.

Another of their specialties is Balsa wood products, such as life-rings, life-boats and rafts, and they also use this coated with fibre board as an insulating material on the inside of the steel hulls, and this takes a fine painted finish.

The Shallow Boat Company demonstrated a device which they have patented on a tunnel-stern flat-bottom boat to produce greater efficiency. In the ordinary tunnel boats there is sometimes a loss of power due to the difficulty in keeping the tunnel full of water. This device consists of a standpipe or chamber over the highest part of the tunnel, from which all the air is extracted by means of a vacuum pump, thereby having a column of water at all times over the propeller, and the claim is that the height of this column gives the same efficiency as placing the propeller at this depth under an ordinary hull. It seems to work very well and the company have several large commercial orders for which it seems particularly adapted.



Helmsman's Cockpit With Controls. Niagara Runabout

The Engines of the 1917 Power-Boat Show

By A. E. Potter

THERE can be no denying that, so far as the engines on the floor and in the boats were concerned, the 1917 Power-Boat Show, just closed, was the most interesting one ever held. There was much to be seen, as I discovered after spending over a week in investigating features and novelties, narrowly missing several important ones.

There were shown 125 different types and models of four-stroke-cycle, and 56 two-stroke-cycle, in addition to one four-stroke-cycle and 9 two-stroke-cycle detachable or outboard types of gasolene engines, and two four-stroke-cycle and two two-stroke-cycle semi-Diesel or heavy-oil engines, or a total of 195 different types and models.

This does not include two motor-car and truck engines, the experimental engine of the Driggs Ordnance Company, and several compact and serviceable-looking lighting and pumping outfits, one of which latter combined a two-stroke-cycle-heavy-oil or semi-Diesel type of engine in its make-up. There was no Diesel engine shown, although the New London Ship & Engine Company, of New London, Conn., had a large space but no engine on exhibit.

For the purpose of comparison, I have tabulated the marine engines under four headings, viz.: marine four-stroke-cycle, marine two-stroke-cycle, detachable, two and four-stroke-cycle, and semi-Diesel, also both two and four-stroke-cycle. Some of the engines listed under the general heading of gasolene were equipped to use kerosene. These will be mentioned when, later on, the engine exhibits are detailed.

In the four-stroke-cycle table will be found the names of the engines arranged alphabetically. The number of cylinders, bore, stroke and revolutions per minute are followed by four horsepower ratings, first that of the manufacturer, next the rating by the S. A. E. (Society of Automotive Engineers) which assumes a net mean effective pressure of 67½ lb per square inch, at a piston speed of 1,000 feet per minute. In other words, the number of revolutions per minute is not used to compute this rating. The American Power-Boat Association rating, which follows, is based on approximately 66 lb per square inch, and not 61 lb as appears in last month's RUDDER in my description of the engines at the two New York Automobile Shows, and considers the speed also. The hydroplane rating which follows shows the horsepower calculated for engines to be used in hydroplanes according to the A. P. B. A. Most of the engines shown are manifestly unsuited for hydroplane use. This rule takes into account the area of the cylinder bore, the number of cylinders and the length of stroke, but does not consider the number of revolutions per minute. The rule is to multiply the area of one cylinder by the number of cylinders by the stroke in inches, dividing this final product by a constant, nine.

The column M. E. P. is the net mean effective pressure necessary to secure the manufacturer's rated horsepower. Remembering that the assumed average of the automobile authorities is 67½, and that the A. P. B. A. has taken 66 as a basis for estimating horsepower of four-stroke-cycle and 44 for two-stroke-cycle, and it should prove interesting and instructive. It has been something of a task to make and prove these calculations.

For rules and methods of arriving at these figures, I will refer you to the February issue of THE RUDDER.

In the column of weights each entry is preceded by a small letter. When this letter is "a" it indicates that the weight includes both the engine with its flywheel, and a reverse gear; "b" indicating that the flywheel is included but no reverse gear; "c" that there is a reverse gear but no flywheel, such as may be employed in a hydroplane, and "d" that there is neither flywheel nor reverse gear.

In the matter of price, I shall have to refer you to the detail of the exhibits, which immediately follows the tables.

In the two-stroke-cycle table there is no S. A. E. rating, for the reason that so far as I know, there is no rule for computing the horsepower of two-stroke-cycle automobile engines.

I have also omitted the S. A. E. rating in the tables of detachable engines and semi-Diesel.

MARINE FOUR-STROKE-CYCLE GASOLENE

Name of Engine	Cyls.	Bore	Stroke	R. P. M.	Mfrs'. H.P.	S. A. E.	A. P. B. A.	Hydroplane	M. E. P.	Weight	Price
Anderson.....	1	4	4	600	2¾	6.40	2.51	5.60	65.65	a 250	$116.00
.....	2	4	4	600	5	12.80	5.03	11.17	65.65	a 350	230.00
.....	1	4½	5	550	4	8.10	3.64	8.83	72.43	a 375	158.00
.....	2	4½	5	550	8	16.20	7.29	17.67	72.43	a 550	310.00
.....	4	5	6	500	24	40.00	19.64	52.36	67.23	a1000	760.00
Aristocrat.....	4	2⅝	4	1000–1500	9–12	11.02	7.22– 10.82	9.62	82.31– 73.17	a 260	200.00
Bridgeport...243.....	3	6½	7½	400	24	50.70	24.88	82.95	63.64	a1800	1145.00
242.....	2	7½	9	375	24	45.00	24.85	88.36	63.74	a2000	1170.00
363.....	3	7½	9	375	36	67.50	37.28	132.53	63.74	a3200	1720.00
Buffalo.....Tender	2	3	4	700	3– 4	7.20	3.30	6.28	60.02– 80.03	a 240	253.00
Auto-Mar.....	4	3¼	5	900	16–20	22.50	10.57	24.54	63.74– 79.46	a 710	635.00
Auto-Mar.. ..	4	4¼	5	900	25–30	36.10	26.58	39.36	62.07– 74.49	a 930	810.00
Heavy Duty..	4	5	6½	450	20–24	40.00	19.44	56.72	68.95– 82.74	a1960	1178.00
Cruis.-Runab..	4	5½	7	600– 900	40–60	48.40	33.36	73.91	79.37	a1730	1350.00
Heavy Duty..	2	6	7½	350	13–15	28.80	12.37	47.12	69.36– 80.03	a1400	775.00
Cruis.-Runab..	4	6¼	9	500– 800	50–80	72.90	53.68	143.14	61.48	a2600	1890.00
Heavy Duty..	4	7	9	350	40–45	78.40	40.41	154.44	65.33– 73.50	a3655	1875.00
Caille.....Aristocrat.....	4	3¼	3½	800	14	16.90	7.74	12.91	119.34	a 660	500.00

MARINE FOUR-STROKE-CYCLE GASOLENE—*Continued*

Name of Engine		Cyls.	Bore	Stroke	R P.M.	Mfrs' H.P.	S.A.E.	A.P.B.A.	Hydroplane	M.E.P.	Weight	Price
Curtiss	OXX	V- 8	4¼	5	1400	100	57.80	66.20	63.05	99.69	c 365	. . . . .
	V-2	V- 8	5	7	1400	200	80.00	128.28	122.17	102.90	c 675	. . . . .
	V-4	V-12	5	7	1400	300	120.00	192.42	183.26	102.90	c1250	. . . . .
Driggs		6	4	6	1000	50	38.40	37.70	50.27	87.54	a1100	$1500.00
Duesenberg	Airplane	4	4¼	7	2000	130	36.10	82.69	55.10	103.76	d 420	2500.00
	Airplane	V-12	4⅜	7	1500	305	114.08	196.99	174.22	102.72	d 960	8500.00
	Marine	8	6¼	7¾	1000–1500	300–400	145.80	184.99– 277.32	238.56	107.09– 95.20	a3500	5500.00
Elco	Express	4	5⅜	6	1100	65	49.50	53.46	66.80	80.24	a 950	1210.00
	Express	6	5⅜	6	1100	100	74.26	80.19	100.20	80.24	a1350	1815.00
Fay&Bowen	L-40	4	3¼	4½	1400	17	16.90	17.42	16.59	64.40	a 450	475.00
	L-41	4	3½	5	1200	22	19.60	19.34	21.38	75.46	a 450	675.00
	L-41	4	3½	5	1200	22	19.60	19.34	21.38	75.46	a 525	635.00
	L-42	4	4	5¼	600–1000	15–28	25.60	13.19– 21.99	28.76	75.03– 84.03	a 600	780.00
	L-43	4	4½	5½	600–1000	20–35	32.40	17.49– 29.16	38.88	75.45– 79.22	a 885	840.00
	L-63	6	4½	5½	600–1000	30–50	48.60	26.24– 43.74	58.31	75.45	a 900	1425.00
	L-44	4	5	6¼	600–1000	30–45	40.00	24.54– 40.91	54.54	80.67– 69.91	a1095	1000.00
	L-64	6	5	6¼	600–1100	45–75	60.00	30.82– 67.50	81.81	86.67– 73.34	a1200	1600.00
Ferro		4	2¾	4	1000–1400	10–14	12.10	7.92– 11.09	10.70	83.34	a 290	275.00
		4	4	6	600–1000	20–35	25.60	15.08– 25.13	33.51	87.56– 91.94	a 900	737.75
Frisbie		1	4¾	5	400– 600	3– 5	9.03	2.95– 4.43	9.84	67.02– 74.46	a 325	262.00
		3	4¾	5	500– 700	12–18	27.08	11.08– 15.01	29.52	71.59– 76.87	a 650	689.60
		2	6	6	400– 550	12–16	28.80	11.31– 15.35	37.70	70.03– 67.91	a 700	554.00
		4	6	6	475– 650	30–40	57.60	26.86– 36.55	75.40	73.71– 71.82	a1200	1123.00
Gray	F	4	3	4	900–1200	12–15	14.40	8.48– 11.31	12.57	93.37– 87.62	a 440	356.00
	D	4	3¾	4½	900–1100	20–24	22.50	14.91– 18.22	22.09	88.53– 86.99	a 550	435.00
Kermath	Standard	4	3½	4	900	12	19.60	11.55	17.10	68.60	b 375	260.00
	Standard	4	3½	4	900	12	19.60	11.55	17.10	68.60	a 430	320.00
	Model	4	3¾	4	800	16	22.50	11.78	19.64	89.63	a 440	350.00
	Vanadium	4	4	4	900	20	25.60	15.08	22.34	87.53	a 460	395.00
Lacy		V- 8	4¼	6	1500	100	57.80	85.12	75.66	77.57	a1240	1975.00
Lathrop		2	5⅛	6½	500	12	21.43	11.45	30.53	69.18	a 900	350.00
		3	5⅛	6½	500	21	32.29	17.17	45.79	80.71	a1200	545.00
		4	5⅛	6½	500	28	43.05	22.90	61.06	80.71	a1500	700.00
Mianus	F2	2	6	8	400	16	28.80	15.08	50.27	70.03	a1600	750.00
	F4	4	6	8	400	32	57.60	30.16	100.53	70.03	a2750	1400.00
Miller		4	3½	5	600–1000	12–20	19.60	9.62– 16.04	21.38	82.32	a 600	375.00
		4	5¼	7½	400– 550	28–35	44.01	21.72– 29.76	72.16	88.31– 77.36	a1600	830.00
Palmer	TM4	4	2¼	3¼	1000–1500	8–10	12.10	6.43– 9.56	8.70	82.06– 68.39	a 310	225.00
	NLS1	1	4½	6	500– 600	4¾	8.10	3.98– 4.77	10.60	74.70– 62.18	b 400	125.00
	NLS2	2	4½	6	500– 600	9	16.20	7.96– 9.54	21.21	74.70– 62.18	a 750	300.00
	NLS4	4	4½	6	500– 600	18	32.40	15.92– 19.08	42.41	74.70– 62.18	a1200	550.00
	NR1	1	5	6	500– 600	5	10.00	4.91– 5.89	13.09	67.23– 56.02	a 520	180.00
	NR2	2	5	6	500– 600	10	20.00	9.82– 11.78	26.18	67.23– 56.02	a 750	325.00
	NR3	3	5	6	500– 600	15	30.00	14.73– 17.67	39.27	67.23– 56.02	a1000	470.00
	NR4	4	5	6	500– 600	20	40.00	19.64– 23.56	52.36	67.23– 56.02	a1250	575.00
	F2	2	6⅜	8	400	16	32.51	17.02	36.74	62.03	a1600	575.00
	F3	3	6⅜	8	400	24	48.77	25.54	85.11	62.03	a2000	850.00
	F4	4	6⅜	8	400	32	65.03	34.05	113.48	62.03	a2400	1100.00
	NK2	2	7½	10	300– 400	20– 25	45.00	22.09– 29.45	98.17	59.76– 56.02	a3000	850.00
	NK3	3	7½	10	300– 400	30– 35	67.50	33.13– 44.17	147.26	59.76– 52.29	a3600	1250.00
	NK4	4	7½	10	300– 400	45– 50	90.00	44.18– 58.90	196.35	67.23– 56.02	a4200	1500.00
	NK6	6	7½	10	300– 400	75– 80	135.00	66.27– 88.36	294.52	74.73– 59.76	a5900	2200.00
Peerless		4	5	6	600–1000	25– 35	40.00	23.56– 39.27	52.36	70.03– 58.89	a 725	475.00
		4	5¾	7	500– 700	40– 50	52.90	30.27– 42.42	80.79	87.14– 77.81	a1500	675.00
Regal	FA	1	4	4½	800	4	6.40	3.77	6.28	70.00	b 250	113.00
	FB	2	4	4½	800	8	12.80	7.54	12.57	70.00	a 450	263.00
	UA	1	4½	5½	600	5	8.10	4.37	9.72	75.45	b 350	150.00
	UB	2	4½	5½	600	10	16.20	8.75	19.44	75.45	a 700	338.00
	UC	4	4½	5½	600	20	32.40	17.49	39.88	75.45	a 950	525.00
	EA	1	5¼	6½	550	7	11.00	6.95	15.64	71.64	b 500	188.00
	EB	2	5¼	6½	550	14	22.01	12.90	31.37	71.64	a 950	413.00
	EC	4	5¼	6½	600	30	44.01	28.14	62.54	70.36	a1425	750.00
	JC	4	6½	7	450– 500	36	67.60	34.84– 38.71	103.23	68.19– 61.37	a2500	1125.00
Scripps	Special	4	3¼	3½	800–1000	15	16.90	7.74– 9.68	12.91	125.29–107.10	a 425	298.00
	MB	2	4½	5	750– 900	13– 15	16.20	9.94– 11.93	17.67	86.31– 83.00	a 650	585.00
	HB	4	4½	5	800–1100	30– 35	32.40	21.21– 29.17	35.34	93.37– 79.22	a 725	980.00
	EB	6	4½	5	750– 900	50– 55	48.60	29.82– 35.78	53.01	110.66–101.44	a 950	1410.00
	C6	6	5	7	1000–1300	100–125	60.00	68.72– 89.34	91.63	96.03– 92.34	a1600	2150.00
Speedway	Z	4	4½	5½	1000–1200	35– 44	32.40	29.16– 34.99	38.88	79.22– 83.00	a 850	1200.00
	N	6	4½	5½	1000–1200	50– 66	48.60	43.74– 52.83	58.31	75.45– 83.00	a1200	1500.00
	M4	4	5¾	7	1000–1200	75– 90	52.90	60.59– 72.71	80.72	81.70	a1350	1950.00
	M6	6	5¾	7	1000–1200	130–150	79.35	90.89–106.06	121.08	94.40– 90.77	a1800	2750.00
	M8	8	5¾	7	1000–1200	175–200	105.80	121.18–145.42	161.44	93.34– 90.80	a2300	3750.00
	C	6	6	6	800	60– 80	86.40	50.89– 66.36	113.10	77.81	a2300	1750.00
Standard		4	6½	8	600	80	67.60	53.09	117.98	99.37	a3500	2250.00
Sterling	Kid E4	4	2¾	4½	1000	10	12.10	8.91	12.04	74.08	a 250	525.00
	B4	4	4⅜	5½	600–1000	20– 35	30.63	16.54– 27.56	36.74	79.82– 83.81	a 620	825.00
	FH4	4	5½	6¾	400– 800	25– 55	48.40	21.38– 42.76	71.27	77.25– 84.89	a1650	1800.00
	FS4	4	5½	6¾	1200–1400	90–101	48.40	64.15– 74.84	71.20	92.60– 88.19	a1250	1800.00
	FS6	6	5½	6¾	1200–1400	130–145	72.60	96.22–112.26	106.81	89.17– 85.25	a1675	2300.00
	FS8	8	5½	6¾	1200–1400	180–200	96.80	128.29–149.90	142.41	92.60– 88.19	a2150	3100.00
	R8	8	5½	6¾	1500–1700	225–250	96.80	160.37–181.75	142.41	92.60– 90.78	a1495	3000.00

MARINE FOUR-STROKE-CYCLE GASOLENE—*Continued*

Name of Engine		Cyls.	Bore	Stroke	R.P.M.	Mfrs'. H.P.	S. A. E.	A. P. B. A.	Hydroplane	M.E.P.	Weight	Price
Sterling	D2	2	5½	7	450– 500	12– 15	24.20	11.09– 12.32	36.96	71.43– 80.36	a1065	$475.00
	D6	6	5½	8	450– 500	50– 60	72.60	42.96– 47.52	126.71	77.63– 83.34	a3700	3000.00
	D4	4	6½	9	400– 450	45	67.60	39.82– 44.80	132.72	74.59– 66.30	a2850	2000.00
	D6	6	6½	9	400– 450	70	101.40	59.73– 67.20	199.09	77.44– 68.84	a3600	2850.00
	D8	8	8¼	10	450– 500	200	217.80	160.48–178.31	475.17	82.31– 74.08	a7000	6000.00
	FM8	8	6¼	9	800–1000	240–300	145.80	171.37–214.71	286.29	92.22	a5600	7500.00
20th Century		4	6½	8½	400– 500	40– 50	67.60	37.60– 47.00	125.35	70.20	a3400	2400.00
Universal		4	2⅜	4	1600	9– 12	11.02	11.55	9.62	51.45– 68.60	a 325	250.00
Van Blerck	H–4	4	5⅜	6	650–1000	40– 55	48.40	30.89– 47.52	63.36	85.48– 76.40	a1397	1500.00
	I–4	4	5⅜	6	1000–1500	65– 85	48.40	47.52– 70.78	63.36	90.30– 78.71	a1347	1500.00
	I–6	6	5¼	6	1000–1500	100–135	72.60	71.28–106.17	95.03	92.68– 83.36	a1611	2000.00
	I–8	8	5¼	6	1000–1500	135–178	96.80	95.04–141.56	126.71	93.76– 82.41	a2055	2950.00
	J–4	4	6	6	1000–1500	80–106	57.60	56.55– 84.82	75.40	93.37– 82.44	a1446	1725.00
	J–6	6	6	6	1000–1500	125–160	86.40	84.82–127.23	113.10	97.26– 82.99	a1896	3050.00
	J–6	6	6	6	1000–1500	125–160	86.40	84.82–127.23	113.10	97.26– 82.99	a1686	2300.00
	J–8	8	6	6	1000–1500	163–215	115.20	113.10–169.64	150.80	93.35– 83.64	a2161	3400.00
Wisconsin	QM	4	3¼	5	1000	18	16.90	13.80	18.44	85.92	a 430	375.00
	CM	4	3¼	5	1000	22	22.50	18.41	24.54	78.86	a 505	450.00
	AM	4	4¾	5½	1000	40	36.10	32.49	43.29	81.26	a 695	700.00
	GM	6	4¾	5	1000	60	54.15	44.30	59.04	89.39	a1125	1100.00
	JR	4	5^{1}/$_{10}$	5½	2200	110	41.62	82.39	49.94	88.11	a 875	1125.00
	NR	8	5^{1}/$_{10}$	5½	2200	205	83.23	164.78	99.89	88.11	a1375	2500.00
	DRM	4	5^{3}/$_{10}$	7	2200	120	42.26	109.02	66.07	72.65	a1100	1500.00
	DM	4	5¼	7	900	60	44.01	45.46	67.35	81.26	a 914	1025.00
	KM	6	5¼	7	800	80	66.01	60.61	101.02	87.11	a1450	1475.00

MARINE TWO-STROKE-CYCLE GASOLENE

Name of Engine		Cyls.	Bore	Stroke	R. P. M.	Mfrs'. H.P.	A. P. B. A.	Hydroplane	M. E. P.	Weight	Price
Bridgeport	30	1	3½	4	500	2½	2.30	4.59	47.96	b140	$118.00
	40	1	4½	5	500	4	4.42	8.84	39.84	b225	130.00
	80	2	4½	5	500	8	8.84	17.61	39.84	b375	295.00
	S–1	1	5¼	5½	800	11	10.10	12.83	47.91	b260	170.00
	50	1	5¼	5½	500	5½	6.31	12.83	38.33	b260	155.00
	100	2	5¼	5½	500	11	12.63	25.66	38.33	b470	350.00
	70	1	5½	6	450	7	7.13	15.84	43.21	b420	185.00
	90	1	6½	6½	400	9	9.59	23.96	41.31	b495	220.00
	180	2	6½	7	400	18	20.25	31.62	37.75	b900	560.00
Caille	Perfection	1	3½	3¼	800	2½	2.78	3.47	39.58	b140	128.00
	Perfection	1	3⅛	3½	800	4	3.67	4.59	47.97	b150	138.00
	Unit	2	3⅛	3½	800–1000	8	7.34– 9.17	9.17	47.97–38.40	a245	286.00
	Perfection	1	4¾	4½	800	6	7.08	8.86	37.25	b200	195.00
	Perfection	1	4¾	4½	800	6	7.08	8.86	37.25	b200	175.00
	Heavy Duty	1	5¾	5	600	8	7.22	12.03	48.60	b300	228.00
Eagle	2K	2	3½	3¼	900	7	6.71	7.45	45.91	b136	160.00
	L	1	4½	4	450– 800	3½–5	2.67– 4.75	5.96	57.62–46.30	b165	135.00
	2–O	2	4½	4	800–1300	12–17½	11.31–18.38	14.14	46.69–41.90	a350	200.00
Evinrude	Inbd	1	2½	2½	800	2	1.20	1.51	73.30	b 35	60.00
	Inbd	2	2½	2½	1000–1100	5	3.01– 3.31	3.07	73.17–66.52	b 50	100.00
	Inbd	1	3¼	3	650	3½	1.80	2.77	85.83	b115	125.00
Fay & Bowen	22	2	4½	4½	550	10	8.74	15.90	50.30	a510	360.00
Ferro		1	3⅛	3¼	700–900	3	2.26– 2.92	3.23	58.37–45.40	a225	127.00
		2	3⅛	3¼	700–900	6	4.52– 5.93	6.46	58.37–45.40	a240	243.00
		2	4¼	4½	600–800	11	8.04–10.72	13.40	60.21–45.16	b294	212.50
		1	5	5	400–700	7½	4.36– 7.64	10.96	75.63–43.22	b250	130.00
Gray	U–1	1	3½	3½	700	3	2.62	3.74	50.40	b 89	74.00
	U–1	2	3½	3½	700	6	5.24	7.48	50.40	a187	175.50
	U	1	4½	4½	700	5½	4.69	6.70	51.61	a275	160.00
	U	2	4½	4½	700	11	9.38	13.40	51.61	a385	234.00
Koban	Inbd	2	2½	2½	900	3	2.57	2.86	51.40	b 67	85.00
Lathrop		1	4	4	500	3	2.79	5.58	47.27	b150	90.00
		1	4½	5	500	4	4.42	8.84	39.84	b200	100.00
		2	5⅜	5	500	10	11.74	23.48	42.21	b475	220.00
		1	5½	5	500	6	6.60	13.20	40.00	b325	115.00
		2	5½	5	500	12	13.20	26.40	40.00	b500	240.00
		1	6	6½	400	7	8.17	20.42	37.70	b500	150.00
Mianus	A–1	1	4	4	550	3	3.07	5.59	43.41	b165	76.50
	A–2	2	4	4	550	6	5.54	11.17	47.27	a390	324.50
	A–1	1	4⅜	5	500	5	4.67	9.33	47.13	b280	110.00
	A–2	2	4⅜	5	500	10	9.33	18.67	47.13	a610	428.00
	M–1	1	4⅜	5	700	6	6.53	9.33	40.48	b280	100.00
	M–2	2	4⅜	5	700	12	13.07	18.67	40.48	b500	200.00
	A–1	1	5⅜	6	450	7½	7.29	16.20	45.27	b415	150.00
	A–2	2	5⅜	6	450	15	14.58	32.40	45.27	a850	394.25
	A–1	1	6½	7	375	10	9.68	25.81	45.47	b675	200.00
	A–2	2	6½	7	375	20	19.36	51.62	45.47	a1280	492.50
Palmer	Q–1	1	3¼	3½	650	2½	2.80	4.30	39.40	b125	60.00
	Q–2	2	3¼	3½	650	5	5.60	8.59	39.40	b180	100.00
	C	1	4½	4½	450	3½	3.58	9.72	43.04	b225	90.00
	P–1	1	4½	4½	600	4	4.77	7.95	36.89	b220	90.00
	P–2	2	4½	4½	600	8	9.54	15.90	36.89	a450	215.00
	D	1	5	6	450	6	5.90	13.09	44.80	b350	120.00

MARINE TWO-STROKE-CYCLE GASOLENE—*Continued*

Name of Engine		Cyls.	Bore	Stroke	R.P.M.	Mfrs'. H.P.	A.P.B.A.	Hydroplane	M.E.P.	Weight	Price
Waterman	K-1	1	2¾	3	800–1400	2	1.61–2.81	2.01	55.56–31.75	b 36	$60.00
	K-2	2	2¾	3	800–1400	4–5	3.21–5.62	4.01	55.56–39.69	b 60	100.00
	A-4	1	4	4	600–1000	4	3.35–5.59	5.59	52.52–31.51	b111	75.00

OUTBOARD OR DETACHABLE TYPES

Name of Engine		Cyls.	Bore	Stroke	R.P.M.	Cycle	Rated	A.P.B.A.	Hydroplane	M.E.P.	Weight	Price
Arrow		1	2¼	2½	1000	2	2½	1.67	1.67	66.69	b 68	$100.00
		2	2¼	2½	1000	2	4	3.35	3.35	53.35	b 96	140.00
Caille	Bantam	1	2⅜	2½	750– 800	2	2	1.13–120	1.51	78.19–73.30	b 40	65.00
	Master 5 speed	1	2⅜	2½	800	2	2	1.20	1.51	73.30	b 75	100.00
	Neptune	1	2⅜	2½	800	2	2	1.20	1.51	73.30	b 65	70.00
Evinrude		1	2⅜	2½	900	2	2	1.35	1.51	65.19	b 70	90.00
		2	2¼	2½	900	4	4	1.49	2.21	177.08	b 95	125.00
Ferro		1	2¾	3	800–1200	2	2½	1.44–2.16	1.80	76.22–50.81	b 65	90.00
Koban		2	2¾	2¾	900	2	3	2.57	2.86	51.40	b 65	112.50
Porto		1	2¼	3	1000	2	3	2.01	2.01	66.67	b 69	100.00

SEMI-DIESEL TYPES

Name of Engine	Cyls.	Bore	Stroke	R. P. M.	Cycle	Mfrs'. H.P.	A.P.B.A.	Hydroplane	M.E.P.	Weight	Price
Fairbanks Morse	4	8½	10	400	2	60.00	100.88	.....	.....	a8000	.....
	3	10½	12½	340	2	75.00	121.64	.....	.....	b12000	.....
Standard Oil Engine	2	6	7½	475	4	16.00	16.79	.....	62.90	a1000	$1090.00
	4	7½	10	375	4	50.00	55.22	.....	59.76	a4000	3090.00

In the following details of the engines exhibited, there may be slight inaccuracies in the prices and equipment furnished. In the main, however, the information gleaned will be found correct. Much of it had to be learned by careful observation and quizzical conversation, and I am sorry to say some of the information handed me was grossly inaccurate. By carefully checking with catalogs and from my own knowledge of engines and their manufacturers, I think I have eliminated practically all of such erroneous and misleadng information.

Anderson engines, manufactured and exhibited by the Anderson Engine Company, Chicago, were all of the four-stroke-cycle type, with non-removable cylinder heads. Prices quoted include propeller wheel and bronze shaft, with a magneto on all sizes above 8 h.p.

Aristocrat, manufactured by the Corson Motor Company, Detroit, and shown by Bruns, Kimball & Co., New York, was of the four-cylinder en bloc type with removable cylinder head. The price includes a hand rear starter.

Arrows, manufactured and shown by the Arrow Motor & Machine Company, New York, were shown in single and double-cylinder-opposed two-stroke-cycle models, in connection with a Porto single-cylinder detachable and three Waterman inboard types, these other models being also of the two-stroke-cycle type, and are now manufactured and marketed by the Arrow Company. All these engines had non-removable cylinder heads. Prices of the inboard engine include only the muffler and carbureter.

Bridgeports, manufactured and shown by the Bridgeport Motor Company, Bridgeport, Conn., who have long used the slogan "The motor that motes," were shown in both two and four-stroke-cycle. All Bridgeports have removable heads. The three-cylinder, 24-h.p. is a 1917 model. In their two-stroke-cycle line only one model was shown in two-port, although either two or three-port is optional at the same price. Their Model 50 was equipped with a kerosene vaporizing equipment, which it is claimed reduced the power but 10 to 15%, and which can be installed at slight additional expense. One of the four-stroke-cycle engines was equipped to use either kerosene or gasolene, having a Kingston Duplex carbureter. The prices on the two-stroke-cycle engines do not include propeller equipment, while those on the four-stroke-cycle do.

Buffalos, manufactured and shown by the Buffalo Gasolene Motor Company, Buffalo, N. Y., were shown in eight models and types. They were all of four-stroke-cycle. All had non-removable cylinder heads, and Bosch magnetos. A special truck engine was also shown, designed for fire engine and other heavy commercial truck service, and an electric generating set. Prices include magneto and all equipment, except bronze propeller shaft.

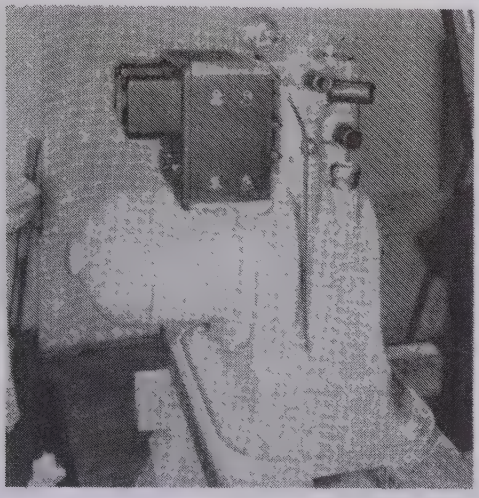
Cailles, manufactured and shown by the Caille Perfection Motor Company, Detroit, included one four-stroke-cycle, six two-stroke-cycle inboard and three outboard or detachable engines. The four-stroke-cycle Caille Aristocrat was equipped with an electric starting and lighting system, which, with an ignition magneto, is included in the price listed. Cylinder heads are non-removable. The Caille unit price includes magneto, Bosch or Dixie optional, and like all other Caille engines, propeller equipment also is included. Two Caille engines used Wico magnetos.

The Caille Bantam was the lightest outboard engine shown. The Master five-speed was an interesting model, equipped with a flywheel magneto. The third Caille outboard engine is known as Neptune.

Curtiss engines, manufactured and shown by the



Driggs Silent Valve Engine



Driggs Lighting Outfit

Curtiss Aeroplane Company, Buffalo, N. Y., included two V-8 and one V-12-cylinder models. These engines attracted a lot of attention, especially the last day of the show, following Presidential action in Washington. This type of engine has been used largely and successfully for war purposes in Europe. Owing to present conditions, no list prices even were obtainable.

Driggs Silent Valve engines, manufactured and exhibited for the first time at this show by the Driggs Ordnance Company, New York, caused a great deal of questioning. The idea of a tapered rotary valve with the novel means employed to prevent seizing or scoring were extremely interesting features. The engine construction was necessarily L-head. Heads were non-removable. The price includes magneto, but does not include propeller equipment.

A direct-connected lighting outfit was also shown, employing a Driggs Silent Valve engine.

Duesenbergs, manufactured and shown by the Loew-Victor Engine Company, Chicago, included a double-valve, four-cylinder airplane type, a V-12, and an eight-cylinder model. The four-cylinder model is standard equipment, with the Gallaudet waterplane, a craft of novel appearance, and considered a decided improvement over double engine installation heretofore demanded by the U. S. Government.

An eight-cylinder Duesenberg was installed in the large cruiser exhibited by the Albany Boat Corporation. An interesting feature of this large, as well as of the V-12 engine, is the horizontally located and operated valves in non-removable heads. Prices quoted are nominal, and do not include propeller or electric starting and lighting equipment. A double-valved, four-cylinder Duesenberg automobile engine was also shown.

Eagles, manufactured by the Standard Company, Torrington, Conn., were in the exhibit of Bruns, Kimball & Co., New York. Three models were shown, all of the two-port, two-stroke-cycle type, with removable cylinder heads, one with battery jump-spark ignition, another using battery make-and-break, while the third was equipped with a high-tension magneto. Prices listed include the engine, muffler and carbureter only.

Elcos, manufactured and shown by the Electric Launch Company, Bayonne, N. J., were of their new Express model. The six-cylinder was exhibited installed in a large express or fast ferry craft, and was complete with electric starting and lighting equipment, while the four-cylinder was at the Bosch booth, showing the Bosch combined lighting and starting equipment and Bosch ignition magneto installed.

Prices quoted include engine and carbureter, and no propeller, magneto nor other equipment. Elco engines have their cylinders in pairs, with removable cylinder heads.

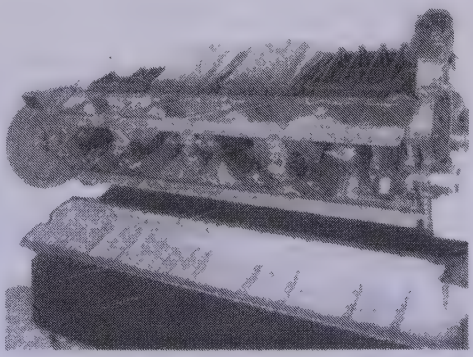
Evinrudes, manufactured and shown by the Evinrude Motor Company, Milwaukee, were exhibited in both two and four-stroke-cycle types, for both inboard and outboard installation. They all were equipped with flywheel magneto ignition. Three two-stroke-cycle inboard were shown, one single-cylinder, two-stroke-cycle and one double-cylinder, four-stroke-cycle outboard or detachable types. The double-cylinder is of opposed type. All have non-removable cylinder heads.

The prices of the inboard engines do not include propeller equipment, while quite naturally the outboard types are complete as to equipment.

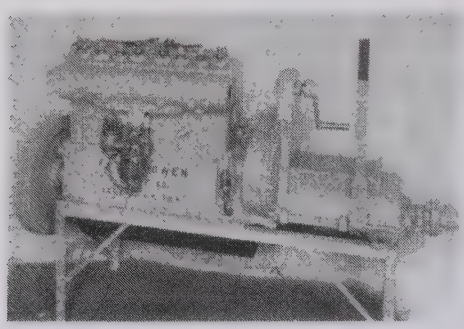
The Evinrude Motor Company had the only four-stroke-cycle outboard engine on exhibit.

Fairbanks-Morse semi-Diesel two-stroke-cycle engines, manufactured and shown by Fairbanks, Morse & Co., Chicago, were the heaviest models shown. They are especially designed for commercial work and are finding favor with large Eastern fishing vessels. For this work, the semi-Diesel seems to be taking the lead over the true Diesel type. Owing to the present unprecedented demand for these engines and the uncertainty of the labor and material situation, no prices were quoted.

Fay & Bowens, manufactured and shown by the Fay & Bowen Engine Company, Geneva, N. Y., were in both two and four-stroke-cycle; however, there was but a single model of the former. The eight models of four-stroke-cycle engines were all equipped with magnetos, while the 17-h.p. had a rear hand starter. Cylinders were cast in pairs with non-removable cylinder heads. The



Duesenberg V-8-Cylinder Model



New Fay & Bowen Engine

45-75-h.p., six-cylinder engine was equipped with an electric starting and lighting system. This model, in its price, includes this convenient and popular accessory. All the four-stroke-cycles include propeller equipment, as well as high-tension magneto. The price of the two-stroke-cycle does not include either magneto or propeller equipment.

Ferros, manufactured and shown by the Ferro Machine & Foundry Company, Cleveland, were in two models of four-stroke-cycle, four in two-stroke-cycle, and an additional detachable type in two-stroke-cycle. The four-cylinder, 20-35-h.p. was equipped with an electric starting and lighting outfit, had overhead valves and removable cylinder heads and cylinder sleeves or liners. The price quoted includes starter but not propeller equipment. No Ferros are quoted with propeller equipment. The double-cylinder, 6-h.p. price includes magneto. The single-cylinder, 5-h.p. was equipped to run on kerosene, starting first on gasolene. The Ferro outboard engine had a longer stroke than any other similar engine shown. The price includes a Bosch high-tension ignition magneto. All Ferros have removable cylinder heads.

Frisbies, manufactured and shown by the Frisbie Motor Company, Middletown, Conn., were in four models, all of the four-stroke-cycle, overhead valve in non-removable cylinder-head type. The especial feature of this construction is to present a minimum amount of surface to the explosion chamber, to prevent excessive heat and power loss through radiation. Prices do not include propeller equipment.

Grays, manufactured and shown by the Gray Motor Company, Detroit, were in four two-stroke-cycle, and two four-stroke-cycle models. The two-stroke-cycle had non-removable cylinder heads, while in the four-stroke-cycle models heads were removable. The four-cylinder models had their cylinders cast in pairs. Their prices include magnetos. The prices given for two-stroke-cycles are for fresh-water equipment. All prices include propeller and shaft, with salt-water equipment, however, for the four-stroke-cycle models.

Kermaths, manufactured by the Kermath Manufacturing Company, Detroit, and in the exhibit of Bruns, Kimball & Co., New York, included their Standard model, both with and without built-in reverse gear, the former with magneto and the latter with Atwater-Kent ignition. Prices do not include propeller equipment. The Model and Vanadium types have magneto ignition, with prices including this accessory. Cylinder heads are non-removable. Kermaths are four-stroke-cycle and all four-cylinder construction, with cylinders cast in pairs.

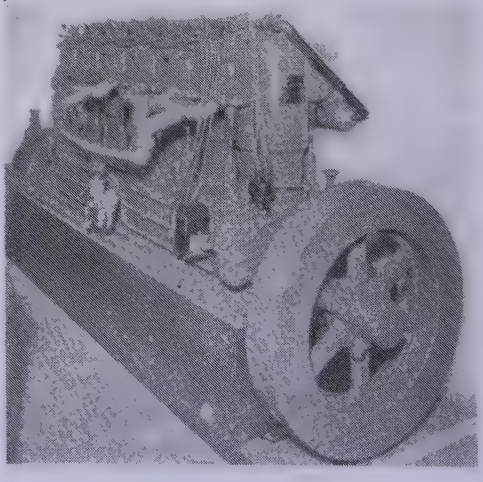
Kobans, manufactured by the Koban Manufacturing Company, Milwaukee, were exhibited by the Ruppert & Colson Launch Company, New York. One was an inboard and the other an outboard type, both double-cylinder, and of the same bore and stroke, two-stroke-cycle. Prices are complete for the outboard, and without propeller equipment for the inboard model.

Lacy, manufactured and shown by the Lacy Marine Motor Company, Rochester, N. Y., was of the V-8-cylinder design with removable cylinder heads, the four cylinders being cast en bloc. This engine in appearance closely resembles the Lacy automobile engine exhibited at the New York Automobile Show. A single model was shown. Price includes magneto but no propeller equipment.

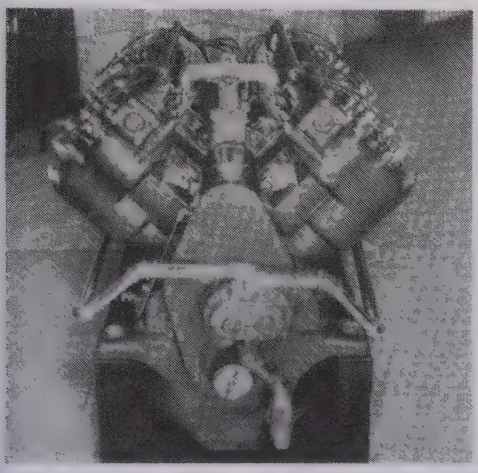
Lathrops, manufactured by the James W. Lathrop Company, Mystic, Conn., and shown by Verrier, Eddy & Co., New York, were in both two and four-stroke-cycle type, six of the former and three of the latter. All had removable cylinder heads. Four of the two-stroke-cycles were equipped with make-and-break ignition, while but one was of the two-port type. Prices quoted do not include any equipment beyond muffler and carbureter. The four-stroke-cycles were all of the same bore and stroke, in two, three and four-cylinder.

Mianus engines, manufactured and shown by the Mianus Motor Works, Stamford, Conn., were in ten two-stroke-cycle and two four-stroke-cycle models. The 3-h.p. engine was equipped to use kerosene, while the double-cylinder, 6-h.p., was equipped with a Splitdorf starting and lighting outfit, which is included in the price quoted. Five of the two-stroke-cycles had make-and-break ignition. The four-stroke-cycles, like all others, had removable cylinder heads. Prices include propeller equipment.

Millers, manufactured by the Miller Gas & Vacuum Engine Company, Chicago, were shown with Ferros. Cylinders in the smaller of the two engines exhibited were



Six-Cylinder Palmer



Lacy V-8-Cylinder Engine

cast en bloc. Both had removable heads and unlike any other engines shown, each had a five-bearing crank shaft. As a matter of fact, the larger engine had six bearings, the flywheel being at the rear, there was an extra support bearing. Prices include carbureter, but no propeller equipment.

Palmers, manufactured and shown by Palmer Bros., Cos Cob, Conn., comprised six two-stroke-cycle and fifteen four-stroke-cycle, a total of twenty-one different types and models. All but two of these, both two-stroke-cycle, were jump-spark. Two of the two-stroke-cycles only had removable cylinder heads, Models C and D, while the TM, which is a new model of en bloc cylinder construction, was the only four-stroke-cycle with removable cylinder heads. Prices of Palmers do not include propeller equipment. This is true in both two and four-stroke-cycle models. The Q-1 Model was shown installed in two boats by the Toppan Boat Manufacturing Company, while the Cape Cod Power Company showed three Palmer models, C, Q-1 and Q-2.

Peerless engines, manufactured and shown by the Peerless Marine Motor Company, Buffalo, N. Y., were in two four-cylinder, four-stroke-cycle models. Cylinder heads are non-removable. The smaller engine had its four cylinders cast en bloc with a two-unit Leece-Neville electric starting and lighting system, especially adapting it for cruising craft. An Atwater-Kent distributer is used on this model. The larger engine is a somewhat earlier model and designed for heavy and medium-duty. Prices do not include electric starting and lighting system nor propeller equipment.

Porto—see Arrows.

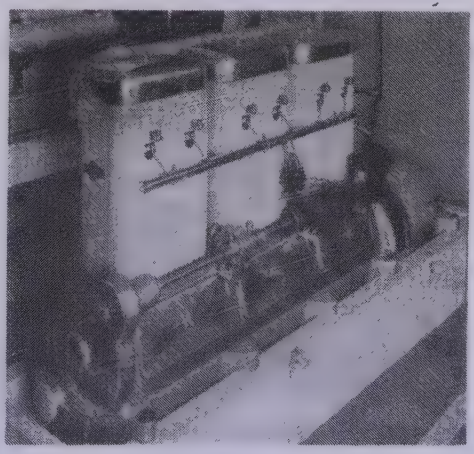
Regals, manufactured and shown by the Regal Gasolene Engine Company, Coldwater, Mich., were in nine different models and types. They were all of the four-stroke-cycle type, with non-removable cylinder heads. The four-cylinder, 30-h.p. engine was equipped with a duplex Kingston carbureter, permitting the use of gasolene or kerosene at will. Prices include neither propeller equipment nor magneto. No extra charge is made for kerosene outfit. This exhibit was delayed in transit and did not arrive until the show was about half over.

Scripps engines, manufactured and shown by the Scripps Motor Company, Detroit, were in five four-stroke-cycle models, while a duplicate of the four-cylinder, 30-35-h.p. was at the Bosch exhibit. Each model was equipped with a combined starting and lighting equipment, with all flywheels encased. The Scripps Special, 15 h.p., had removable cylinder heads, the cylinders being cast en bloc, while the others were cast in pairs. A late arrival was the Scripps Greyhound, or Model C, a long-stroke racing type, completed just in time for nearly the entire duration of the show. Prices quoted include electric starting and lighting equipment in all models except Scripps Special. Propeller equipment is included in none.

Speedways, manufactured and shown by the Gas Engine & Power Company and Chas. L. Seabury & Co., Consolidated, of Morris Heights, N. Y., included six models on the floor and installed in boats. Speedways are all four-stroke-cycle and have non-removable cylinder heads. Cylinders are in pairs. Showing the trend of the demand for electric starting and lighting for the better class of power boats, practically every one of these engines was so equipped, and while the prices quoted do not include it, its addition increases the price by $200 for the smaller sizes and $250 for the larger. Propeller equipment and magneto is furnished with every Speedway.

Standard engines are manufactured by the Standard Motor Construction Company, Jersey City. The first of a new model was shown by the Elco Company, installed in one of their boats. It, like all Standards, was of the four-stroke-cycle type, with removable cylinder heads and outside water connections between the cylinder and cylinder-head jackets, thus obviating any possibility of leak of water into the cylinders from the jackets, or blowing out cylinder-head packing. Price includes both magneto and propeller equipment, and electric starting and lighting.

Standard oil engines, manufactured and shown by the Standard Oil Engine Company, New York, were of



Scripps Greyhound

the four-stroke-cycle type, and while primarily designed for operation on heavy-oil, it is claimed they can be started and operated on gasolene by connecting a gasolene carbureter with suitable stop valve to the intake piping. The 16-h.p. has non-removable cylinder heads, while the 80-h.p. has removable. Prices include propeller equipment.

Sterlings, manufactured and shown by the Sterling Engine Company, Buffalo, N. Y., were in thirteen different models, with a duplicate FS-6 at the Bosch exhibit, to show Bosch magneto and electric starting and lighting installation. Another FS-6 was shown in a boat exhibited by the Albany Boat Corporation, while two D-8's were in the patrol boat shown by the Greenport Basin & Construction Company, and Lawley showed boats equipped, one with a Sterling Kid, and the other with an R-4, which latter model, by the way, was omitted unintentionally in listing the Sterling engines. However, this happily makes fourteen models rather than thirteen. All Sterlings have fully enclosed flywheels and electric starting and lighting outfits as standard equipment. The R-8 model was also shown in Miss Minneapolis, with the record of the fastest boat afloat. The R or racing models all have overhead valves. Sterling prices include electric starting and lighting, magneto and propeller equipment. The Cape Cod Power Company also showed a boat with a Sterling Kid installed.

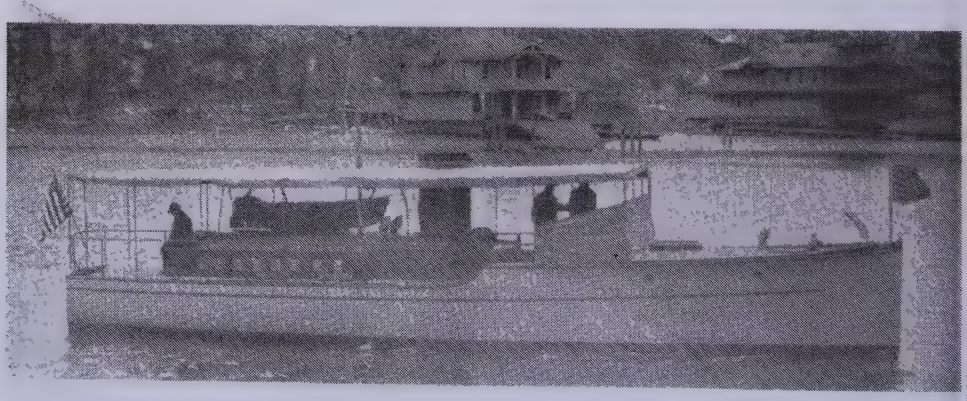
Twentieth Century engines are manufactured by the New York Yacht, Launch & Engine Company, Morris Heights, N. Y. One model was shown by them, a 40-50 h.p., with valves in removable heads. This engine, like but one other shown, had outside water connections from each cylinder water-jacket to its water-jacketed head. This engine is sold to operate on either gasolene or kerosene, a Kingston Duplex carbureter being furnished, I understand, as standard equipment, including magneto and propeller, but no bronze propeller shaft. An interesting feature of this engine was the new type of helical reverse gear, a balanced, noiseless construction which seemed to look business-like. Gears are all hardened and are phosphor bronze bushed.

Universal engines are manufactured by the Universal Motor Company, Oshkosh, Wis. One of this make was shown by the Toppan Boat Manufacturing Company, installed in one of their boats. This engine is of the four-stroke-cycle type, cylinders en bloc, and has a removable cylinder head and a hand rear starter. Price includes rear starter and propeller equipment.

Van Blercks, manufactured and shown by the Van Blerck Motor Company, Monroe, Mich., included eight types and models. In addition an I-8 was installed in the large cruiser shown by the Great Lakes Boat Building Corporation, and an I-6 in a cabin runabout shown by the Luders Marine Construction Company. Van Blercks are all four-stroke-cycle, with non-removable cylinder heads. An extremely interesting feature of the Van Blerck exhibit was a Model J-6, equipped with a 2-to-1 reversing gear, such as is usually employed for hydroplane and similar high-speed work. This permits the engine to be located at the extreme rear with the flywheel facing aft. The propeller shaft returns from the reducing gear forward the engine at an inclined angle of 7°, the propeller running at one-half the speed of the engine. The price of the Model II-4 includes starting and lighting outfit, while propellers are not included as standard equipment for prices quoted.

Watermans—see Arrows.

Wisconsins, manufactured and shown by the Wisconsin Motor Manufacturing Company, Milwaukee, were in nine models and types. One only, the 18-h.p., had a removable head. Two models, the 18 and 22-h.p., respectively, had cylinders cast en bloc, the others being in pairs. In addition, the Greenport Basin & Construction Company showed a CM Model installed in a boat, while the Wisconsin Company showed a DRM Model equipped in a boat of their own manufacture, equipped with electric starting and lighting. All Wisconsin prices are subject to change, and do not include electric starting and lighting. The QM was the only model shown with removable cylinder heads. Prices include magneto but do not include propeller equipment.



One of Four Express Cruisers. 52 Ft. Long, 11 Ft. 4 In. Breadth, 3 Ft. Draught, Built by the Gas Engine & Power Co. and Chas. L. Seabury, Cons.

Yachts Building for 1917

PART I

A list of the new yachts of 1916 was published in THE RUDDER through the Spring and Summer of last year; the record is here taken up, those yachts built in the latter part of 1916, but in commission prior to December 31st, being marked 16, in the first column. This first installment, which will be continued month by month, is necessarily very incomplete; the indications are for a very active season of building, designers, builders and engine manufacturers report many orders, but contracts are not yet made, names and other details are still undecided on. Owners, designers, hull and engine builders and others interested are requested to send in information for the correction and extension of the list.

Steel vessels are indicated by the name being in italics.

POWER

STEAM

Name of Yacht	Owner	L. O. A. Ft.	In.	B. Ft.	In.	D. Ft.	In.	Designer	Builder	Engines, Maker	No.	H.P.
Nokomis	Horace E. Dodge	243	—	32	—	12	10	Gielow & Orr	Pusey & Jones		(2)	...
Isabel	John N. Willys	240	—	26	3	7	2	Cox & Stevens	Bath Iron Works, Ltd.	Bath Iron Wks.	(2)	...

GAS AND DIESEL ENGINES

Consuelo	J. Percy Bartram	110	—	21	—	5	8	J. Murray Watts	G. Lawley & Son Cor	Speedway	(2)	320
Gadfly	Robert K. Cassatt	107	3	20	6	3	6	Gielow & Orr	Kyle & Purdy	Winton	(2)	150
...	Murray Guggenheim	106	—	20	—	3	6	Mathis Y. B. Co.	Mathis Y. B. Co.	Stan I rd	(2)	250
Sachem	N. Bruce MacKelvie	90	7	16	1	5	2	Gielow & Orr	Matthews Co.	Winton	(2)	350
16 North State	F. L. Seeley	85	—	—	—	—	—	F. A. Root	F. A. Root	Sterling	(1)	...
...	Louis L. Driggs	85	—	14	3	—	—	W. H. Hand, Jr.	G. Lawley & Son Cor	Driggs	(2)	.
Nepenthe	James Deering	80	—	17	6	2	6	Mathis Y. B. Co.	Mathis Y. B. Co.	Speedway	(2)	150
...	George H. Ketcham	77	—	16	—	5	3	Matthews Co.	Matthews Co.	Winton	(1)	100
...	Ralph Emery	76	10	14	—	—	—	Swasey, Raymond & Page		Sterling	(2)	600
16 P. S. 8	Harold S. Vanderbilt	74	—	12	9	4	—	Swasey, Raymond & Page	Murray & Tregurtha Co.	Van Blerck	(2)	800
...	Wm. Laidlaw	74	—	12	6	4	—	Swasey, Raymond & Page		Sterling	...	...
...	S. C. Davis	72	—	13	—	—	—	Swasey, Raymond & Page			(2)	...
Whippet	O. G. Jennings	72	—	12	—	3	4	J. W. Hussey	Greenport B. & C. Co.	Sterling	(2)	600
16 Jane VI	A. P. Ordway	71	—	17	6	3	6	Mathis Y. B. Co	Mathis Y. B. Co	Standard	(2)	100
...	J. A. Mollenhauer	70	—	—	—	—	—	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	...	...
...	T. Elwood Allison	70	—	—	—	—	—	Bowes & Mower			...	...
...	Jacob C. Benz	67	—	—	—	—	—	Swasey, Raymond & Page			...	...
...	Ralph Pulitzer	66	—	—	—	—	—	A. E. Luders	Luders Mar. Con Co.	Duesenberg	(2)	800
...	H. W. Starrett	65	—	—	—	—	—	Lee & Brinton		Imperial	(1)	80
Curlew II	L. L. Curtiss	65	—	14	4	4	—	Defoe B. & M. Wks.	Defoe B. & M. Wks.	Sterling	...	...
...	A. A. Schantz	63	—	10	6	—	—	...	American Boat Co.	Van Blerck	...	...
...	James Laughlin III.	63	—	—	—	—	—	Swasey, Raymond & Page		Sterling	...	...
...	Tracy Lewis	60	—	12	—	—	—	W. H. Hand, Jr.			(2)	75
...	A. E. Bechstein	60	—	—	—	—	—	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	...	...
Merry Sunshine	Otis H. Cutler	60	—	13	—	3	—	J. Murray Watts	Smith & Williams	Sterling	...	300
Muirmaid V.	Pierre A. Proal	60	—	14	—	3	—	J. Murray Watts	Red Bank Yt. Wks.	Sterling	...	200
16 Chingachgook	C. P. Brigham	60	—	10	—	3	—	J. W. Hussey	Greenport B. & C. Co.	Sterling	(2)	600
...	John McCormack	57	—	10	—	3	0	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(2)	260
16 Kingfisher	E. L. King	56	—	11	6	3	0	Great Lakes B. B. Cor.	Great Lakes B. B. Cor.	Van Blerck	(2)	200
...	L. G. Hammersley	55	10	10	—	—	—	W. H. Hand, Jr.	R. Jacob	Duesenberg	(2)	800
...	M. F. Plant	55	10	10	—	—	—	W. H. Hand, Jr.	R. Jacob	Duesenberg	(2)	800
Nancy	Felton Bent	55	—	10	6	3	6	J. Murray Watts	J. C. Vanderslice	Sterling	...	200
...	Wm. M. Chesebrough	55	—	—	—	—	—	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	150
...	John P. Wetherill	55	—	11	6	—	—	Swasey, Raymond & Page		Sterling	(2)	...
Topaz VII.	C. W. Clifford, Jr.	54	—	11	—	3	9	W. J. Deed			...	...
...	Robert Cushman	54	—	11	7	4	6	E. N. Burwell			...	60
...	Joshua Crane	53	—	11	—	—	—	Swasey, Raymond & Page		Duesenberg	...	...
16 Elf	L. H. Eisenlohr	51	—	12	—	—	—	Bowes & Mower	S. C. Van Sant	Van Blerck	(2)	300
Marymayd	Percival E. Fansler	50	—	16	—	6	—	J. Murray Watts	Smith & Williams Co.	Kahlenberg	(1)	
...	L. F. Percival	50	—	—	—	—	—	S. H. Brown	J. E. Graves	Sterling	(1)	...
16 Raven III.	C. W. Kotcher	50	—	9	—	2	4	Purdy Boat Co.	Purdy Boat Co.	Speedway	(2)	400
16 Shadow III	Carl G. Fisher	50	—	9	—	2	4	Purdy Boat Co.	Purdy Boat Co.	Speedway	(2)	400
...	E. E. Edwardes	50	—	7	—	3	—	E. N. Burwell		Wisconsin	(2)	...
16 Betty M. III	Chas. W. Kotcher	48	—	10	—	2	9	Carlton Wilby	Church Boat Co.	Van Blerck	(2)	270
16 Sabot	M. T. Clark	48	—	10	10	3	4	Great Lakes B. B. Cor.	Great Lakes B. B. Cor.	Van Blerck	(1)	115
Pythagoras	E. Paul du Pont	46	—	12	—	3	—	J. Murray Watts	Wilmington B. & Con. Co.	Peerless	(2)	70
...	Bernard Lohn	46	—	9	3	—	—	Swasey, Raymond & Page			...	...
...	Silas Adams	46	—	9	6	—	—	Swasey, Raymond & Page		Duesenberg	...	...

Happenings in the Yacht Clubs

Newport Harbor Y. C.

NEWPORT Beach, Cal., has come into the game by organizing a big yacht club with a membership including leading yachtsmen of Los Angeles, Santa Ana, Orange, Fullerton, Riverside, Redlands and San Bernardino joining with Newport to foster the sport, by making restricted classes from a husky 14-foot Cat class for youthful beginners up to yawl and schooner rigged boats for deep-sea work. The Sea Mew, plans of which were printed in THE RUDDER of November last, is the catboat for beginners.

Rowing, canoeing, canoe sailing and hydroplaning will be encouraged, for Newport Bay has eight square miles of landlocked water that is ideal for small crafts and racing.

What has brought this club into being, is the city of Newport placing $100,000 in our bank, to build a jetty at the entrance of the bay to give plenty of water on the bar at low tide. There is also $25,000 on hand to dredge the harbor to a uniform depth. This will make the harbor for the pleasure craft, as there will be the elbow room not found in other harbors on account of their commercial work.

The formal opening of the club took place January 7th, the club holding a reception on board of the Limit, a big excursion boat donated by Jackson & Norton Co.

The officers of the club are: Commodore, Albert Boiland; vice-commodore, P. H. L. Wilson; rear-commodore, I. B. Potter; secretary, J. A. Ricker; directors, A. B. Rousselle, W. W. Watson, Leon A. Atwood, F. W. Peckwith.

San Francisco Y. C.

The annual meeting of the San Francisco Y. C. was held on February 14th, when the following officers were elected: Commodore, Carlton Earl Miller, sloop Athene; vice-commodore, E. A. Polhemus, sloop Aileen; secretary, Frank M. Garden; financial secretary, Wilfred Page; treasurer, Philip J. Fay; directors at large, John Barneson, Carl J. Rhodin.

Raritan Y. C.

The officers of the Raritan Y. C. for the year are: Commodore, Peter C. Olsen; vice-commodore, Louis Compton; treasurer, William Brunner; secretary, William H. Fraser; fleet captain, J W. Barwell.

Yachtsmen's Club, of Philadelphia

J. G. Naefie Whitaker has been reelected Commodore of the Yachtsmen's Club, of Philadelphia. The other officers are: Vice-commodore, Richard Young; rear-commodore, C. C. Earcekson; secretary, James D. Ferris; financial secretary, William H. Drew; treasurer, Edward Board; directors, R. J. Allen, W. H. Biddle and C. W. Shaw, Jr.

Cleveland Y. C.

The contract has just been let and construction started on the new class "R" yacht for Com. Alexander Winton, of the Cleveland Y. C. and the Interlake Yachting Association. This boat is from designs by H. J. Gielow, and the old man has spent about a year getting the boat the way he wants her. He has been out on Lake Erie, was at Put-in-Bay several days studying conditions, and is going to beat the present champion Pam, owned by Commodore Parsons, if such a thing is possible.

There will be seven class "R" boats racing in the C. Y. C. fleet this season. The list is as follows: Pam, Harry A. Parsons (skipper, Bob Power); Mebleh, W. R. Huntington (skipper, M. J. McCarthy); Clarice, Alexander Winton (skipper, Ted Zickes); Psammiad, E. E. Bishop (skipper, C. D. Beeman); Spook II, T. B. VanDorn (skipper, Rol. Francis); Lakewood, Wood Brothers (skipper, H. W. Wood); Neagha, C. B. Lockwood (skipper, A. Feick).

This list shows that the Cleveland Y. C. actually has the largest and fastest fleet of class "R" boats in the world. Boston yachtsmen have tried to buy both Pam and Mebleh to race at Marblehead next Summer.

Now that it has been finally settled that the Lipton Cup is for Class R, the Cleveland Y. C. will go after it with Commodore Harry A. Parson's Pam, Commodore Winton's Clarice and Commodore Huntington's Mebleh.

Stuyvesant Y. C.

The members of the Stuyvesant Y. C. at the annual meeting of the club elected the following officers and committees: Commodore, F. H. Hegeler; vice-commodore, Dr. H. Bruening; rear-commodore, P. W. Hoenack; recording secretary, G. A. Gallowitz; financial secretary, A. J. Dippel; treasurer, C. S. Ogden; measurer, C. H. Clapper; fleet surgeon, J. F. Nelson, M.D.; fleet chaplain, H. P. Fiske; board of directors, A. Knoepfle, F. L. Kelly, Dr. H. G. Scholz, Geo. A. Liptay, H. Lawson; regatta committee, H. P. Fiske, W. Briesemeister, H. Gutmann, Dr. H. Bruening, Geo. Weber; law committee, N. Schelnin, H. C. Winter; auditing committee, C. H. Clapper, H. Ludwig, G. Immisch; membership committee, H. C. Winter, J. H. Jones, G. Immisch.

Horseshoe Harbor Y. C.

The club house of the Horseshoe Harbor Y. C. at Larchmont which was damaged by fire last fall is to be replaced by a new building which will be ready by the opening of the season.

Riverside Y. C., of Essington

Charles Walber was elected Commodore of the Riverside Y. C., of Essington, recently for the third consecutive term. The other officers are: Vice-commodore, John Buckley; rear-commodore, William O'Donnell; secretary, O. B. Hoffman; treasurer, Isaac Mitchell.

Hingham Y. C.

The newly elected officers of the Hingham Y. C. are: Commodore, Walter R. Whiting; vice-commodore, John C. Hollis; treasurer, Charles M. Scudder; secretary, William W. Melcher; executive committee, Walter R. Whiting, John C. Hollis, Charles M. Scudder, William W. Melcher, Benjamin A. Robinson, J. Sumner Fowler and Ray B. Taft; membership committee, G. O. Henderson, Roy E. Litchfield, Dr. Samuel H. Spaulding, George L. Brett, Jr., Robert M. Marsh; regatta committee, H. Preston Arnold, David Cobb, J. Justin Dyer, Charles A. Randall, Frank H. Walker; measurer, Ray B. Taft; delegate to Y. R. U. of Massachusetts, J. Austin Dyer.

Boston Y. C.

William D. Turner, one of the oldest members of the Boston Y. C., has been elected Commodore of that organization. Commodore Turner joined the club in 1897 and has owned about a dozen different yachts. The other officers of the club are: Vice-commodore, L. R. G. Crandon; rear-commodore, Clarence H. Pond; secretary and treasurer, Walter Burgess; executive committee, Thornton K. Burgess, Albert F. Flint, Benjamin P. Kimball, Lancelot Loy; membership committee, Edward E. Fowler, Charles M. Pennycuick, Lewis R. Kimball, Charles F. White, Walter Burgess; regatta committee, Roy W. Pigeon, Charles M. Scudder, Charles W. Chapin, Henry M. Wesson, Leroy A. Jackson, John Black, Jr., W. H. Litchfield.

Interlake Y. A.

Commodore Alexander Winton, of the Cleveland Y. C., was elected Commodore of the Interlake Yachting Association at its recent annual meeting. The other officers elected were: Vice-commodore, C. Lee Abell, Buffalo Y. C.; rear-commodore, T. de Vilbiss, Toledo Y. C.; powerboat measurer, Harry Getrost, Lorain P. B. C.; measurer, sailboats, R. E. Luedtke, Toledo Y. C.; fleet surgeon, Dr. P. B. Robinson, Put-in-Bay Y. C.; librarian, Frank R. Frey; delegate to Y. R. U., Robert E. Power, Cleveland Y. C.; board of governors for Yachtsmen's Fund: W. J. Billingslea, Maumee River Y. C.; F. W. Roberts, Cleveland Y. C.; W. R. Huntington, Put-in-Bay Y. C.; Henry W. Hess, Toledo Y. C.; F. W. Wakefield, Vermilion B. C., and C. D. Lynch, Detroit Y. C.

The Yachtsmen's Fund is to defray the expenses of regattas. Any yachtsman in a club of the association may become a member on payment of $5 annually. Contributing members may fly the Interlake flag while cruising. In the Fund now there are two bonds of $1,000 each and $543.53 in cash.

New York A. C.

The Yachting Department of the New York A. C. has elected the following officers: Commodore, Harry Anderson; vice-commodore, Byron E. Eldred; rear-commodore, Charles M. Sunderland; secretary, Woodhull Hay; treasurer, Dr. Francis Valk. The delegates to the Y. R. A. of Long Island Sound are Harry Anderson, Alfred Brooks Fry, Henry A. Jackson, Edwin H. Tucker, Harry Sanford; to the American P. B. A., Harry Anderson, Henry A. Jackson and Henry Sanford.

New Bedford Power Squadron

The newly elected officers of the New Bedford P. S. are: Commodore, William Heaton; vice-commodore, Morris Mellor; rear-commodore, Fred. Bradley; secretary, Howard Lillie; treasurer, Richard Smith; trustees, John Harrison, William Voyer, Eli Hacking.

Excelsior Y. C.

The newly elected officers of the Excelsior Y. C. are: Commodore, P. H. O'Day; vice-commodore, W. A. Martin; rear-commodore, E. J. Holzman; recording secretary, J. L. Fredlund; financial secretary, C. D. Olmstead; treasurer, Alex. J. Joa.

Ketemowoke Y. C.

The newly elected officers of the Ketemowoke Y. C., of Huntington, are: Commodore, A. E. Kouwenhoven; vice-commodore, F. H. Johnson; rear-commodore, B. G. Sammis; fleet captain, H. W. Kouwenhoven; secretary, H. A. Roselle; treasurer, Z. J. Carll.

Lipton Cup for Class R

After several months of negotiations the Columbia Y. C., of Chicago, has arranged to put the Lipton Cup in competition for yachts of Class R. This trophy was originally offered for the 21-foot cabin class, but that class having died out, it was suggested some months ago by the Cleveland Y. C. that the trophy should be redeeded and offered for Class R, which is the most popular of the small classes on the Lakes. The cup was first raced for in 1902.

The series of races are to be sailed August 20th or September 1st, whichever date will be convenient to the challengers. The Columbia Y. C. will be represented by two new Class R yachts and one existing yacht. Charles Scates, Ashland Block, Chicago, will arrange all the details of the races for the Columbia Y. C.

Bay State Y. C. of Revere

The officers of the Bay State Y. C. of Revere for 1917 are: Commodore, James Hoffses; vice-commodore, W. A. Farr; rear-commodore, G. Fisher; secretary, H. S. Gilchrist; treasurer, George H. O'Hara; directors, A. C. Y. Macadam, W. Stackhouse, H. Annis, H. S. Gilchrist, John W. Odell.

Chesapeake Bay Y. R. A.

The annual cruise of the Chesapeake Bay Y. R. A. will begin on July 21st and end July 28th. The rendezvous will be at Baltimore. The officers of the association for 1917 are: President, A. C. Thompson, Baltimore Y. C.; vice-president, G. Porter Houston, Sherwood Forest Club; secretary-treasurer, Stuart Stevens Scott, Cambridge Y. C.; executive committee: W. W. Varney, Baltimore Corinthian Y. C.; John S. Fulton, Jr., Baltimore Y. C.; A. A. Hathaway, Chesapeake Bay Y. L.; Adrian Sizer, Capital Y. C.; A. B. Bennett, Jr., Corinthian Y. C., of Washington; measurer, L. F. Hewins, Capital Y. C.

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Appreciation from the West

Editor of THE RUDDER:

Let me congratulate you on the acquisition of THE RUDDER, which, since you have taken hold, has been so good. I wish you realized how much some of us that have been in the game back East count on the information which you publish in such a satisfactory way.

Seattle. MARTIN C. ERISMANN.

All About Oilskins

Editor of THE RUDDER:

My oilskins are all stuck together. Tell me what to mix up to put on them and knock the stickiness out of them.

Long Island. J. L. BALDWIN.

"For the yellow kind, a mixture composed of the whites of two eggs, six ounces of linseed oil and the proper proportion of drier. For the black kind, the same as before with the addition of a little lampblack.

"Before applying this to the oilers, they should be thoroughly cleansed with hot gasolene, benzine or kerosene. These three articles may be heated almost to the boiling point if the can or receptacle which holds them is placed in water over a slow fire and kept there until it reaches the desired heat, which is almost boiling."

"To insure a quick easy job of cleaning and painting the oilers, they must be stuffed almost to the bursting point with old rags, hay, sawdust, or anything, so as to make them stand out without wrinkles. The oilers must not be buttoned or fastened with the regular catches, otherwise the front edges would not receive the coating that is desired. This must be overcome by small pieces of string.

"A second and third coat is sometimes necessary where the oilers are very much worn. They should be hung in a shed in the open air, but not in the sun, to dry from one to three weeks. This mixture will keep oilers in first-class shape indefinitely."

Will Race Auxiliary Seabird

Editor of THE RUDDER:

Taking advantage of the possibility of a special class for the Block Island Race in June for which my boat would not otherwise be eligible, I wrote the New York Athletic Club asking them to find two other entries at the same time in order to make up a race.

The very courteous reply received from the Acting Chairman of the Regatta Committee, says, in part: "Nearly every one who enters this race thinks there ought to be a special class to fit his boat, and the consequence is I have about a dozen special classes suggested. I am perfectly willing to give prizes for a dozen special classes but I cannot do more than that, and those men who are interested in special classes must go around among their friends and get me the entries, and, incidentally, the starters. For your information I would say that we have never found any interest among the owners of boats of the size you mention in the Block Island Race, and personally think it would be hard to get up a class, although no one would be more pleased to see it than I."

My boat is an auxiliary Seabird, 26 feet over all, and with her engine of 1904 vintage will plug 6 miles an hour as long as there is gasolene aboard. I want two power boats, or auxiliaries under power alone, to join me in a special class, A. P. B. A. rules to govern, in the Block Island Race, boats to be under 30 feet over all.

Can you find some competitors, preferably those who don't care whether there are prizes or not?

ALEX. W. MOFFAT, *Bayside Y. C.*

Handy Sailing Dinghy

Editor of THE RUDDER:

I am sending you under separate cover a print of my 14-foot dinghy Pompon, South West Harbor, Me., for reproduction in THE RUDDER if you think it of sufficient interest. If you could publish from time to time photographs of a few good dinghies from different sections, I believe it would interest many of your readers, and tend to increase the popularity of a useful type of boat.

E. K. BUTLER.



Pompon, 14-Foot Sailing Dinghy, Owned by E. K. Butler

The Chart Table

Editor of THE RUDDER:

Is there any condition in which a steamer has right of way over a sailing vessel?

New York. NAVIGATOR.

Yes—one and only one, when the sailing vessel is the overtaking vessel.

* * *

Editor of THE RUDDER:

If the gyroscopic compass is successful enough to warrant its use in the Navy, why do not the new large merchant ships carry them?

Massachusetts. D. S. JONES.

The gyroscopic compass is peculiarly adapted to naval work, as it is not as seriously affected by gunfire as a magnetic compass and can be installed below the armor belt in a sheltered position. Without doubt, the large merchant steamers launched recently would have been equipped with them except for the high cost. The equipment of a large merchant vessel would cost about $5,000, whereas the same vessel could be equipped with magnetic cards for about $1,000. It is difficult to see how the large cost of gyroscopic compasses can be lowered, owing to the intricate mechanical construction involved.

* * *

Editor of THE RUDDER:

Why is turpentine used for mixing white paint aboard a ship in preference to linseed oil?

New Jersey. A. L. KAMMERER.

Principally because the turpentine evaporates more quickly and leaves the pigment as a fine powder which washes off when scrubbed, leaving a clean surface and keeping the coat of paint thin and even.

* * *

Editor of THE RUDDER:

What is the size of the largest waves ever measured on the open sea?

New York. A. K. HOTCHKISS.

The largest storm waves ever reported were measured off Cape Horn. They were about 70 feet from crest to trough and 1,000 feet between the crests. Volcanic disturbances under the bed of the ocean have sometimes caused larger waves known as tidal waves, such as are reported in the South Pacific.

* * *

Editor of THE RUDDER:

Some one remarked at the club one night that the direction in which a steel or iron ship lies while building affects the permanent magnetism of the hull. Is such a statement true, and why is it so?

Pennsylvania. T. L. CANNON.

If you hold an iron bar which is not magnetized in a magnetic field and tap it for an interval with a hammer you will find that it will soon become a magnet itself As the polarity of the bar is determined by the direction in which it cuts the lines of force (the end which is pointing to the North pole of the field becoming a South pole) you will readily see that this is exactly what happens to a steel hull when it is under construction. If, for instance, the bow is pointing to the earth's North magnetic pole, the ship slowly becomes a huge bar magnet, the bow being the South pole and the stern the North. If she lies at right angles to the magnetic line of force the induced magnetism is the least, but owing to the line of force cutting the hull at a horizontal angle (shown by the dip of the needle at the latitude) the hull is slightly magnetized, the side to the North becoming a South pole. This is a rather complex process and a full discussion of the subject could not be given in this brief space, but in the column of "Practical Wrinkles," by Lecky, a simple and concise explanation of the subject is given.

The Engine Room

Editor of THE RUDDER:

What caused my propeller shaft to become badly pitted between the propeller and stuffing-box? It is of Tobin bronze. My wheel is of bronze, as is my stuffing-box and stern bearing.

North Carolina. J. R. WATERS.

Electrolysis. Tobin bronze, which has great tensile strength, has a small percentage of iron in its composition.

* * *

Editor of THE RUDDER:

Boat 28 feet over all, 25 feet on water-line, 11 feet breadth. What horsepower engine would you consider to be about right for a boat of this size, heavy-duty type? Kindly answer in Hurrah's Nest. Thanking you very much for your trouble and oblige a subscriber.

New York. A. F. YOUNG.

You failed to state whether your boat is to be used for pleasure or commercial purposes. A 12-h.p. engine would be suitable and give you about all the speed you could expect. If you wish to run more economically, could use less power. A 6-h.p. engine would probably drive the boat at three-quarters the speed you would get with a 12-h.p.

* * *

Editor of THE RUDDER:

How much more power should a four-cylinder, four-cycle engine, 5-inch bore and 6-inch stroke, develop at 500 r.p.m., than a double-cylinder, two-cycle of 6-inch bore and 7-inch stroke at 425 r.p.m.?

New York. RAYMOND C. BOGARDUS.

Provided the same skill and knowledge of design is embodied in both, there should be approximately 86.6% more power. The ratio of total piston displacement is 600 : 504, the number of explosions per minute 1,000 : 850, and the mean effective pressure approximately 4 : 3, the total ratio being $(600 \times 1{,}000 \times 4) : (504 \times 850 \times 3) = 2{,}400{,}000 : 1{,}285{,}200 = 186.6\% : 100\%$ or 86.6% more.

* * *

Editor of THE RUDDER:

Would reverse gears be any more efficient if they would drive the propeller wheel as rapidly when going astern as when in the ahead motion?

Maryland. R. J. C. WINCHELL.

In any reverse gear it is considered best practice to drive astern at a reduced speed, for the reason that when throwing in the reverse one is less liable to stall the engine, the gear itself absorbing a small percentage of the power of the engine. When the propeller wheel is running in the reverse the crowning side of the blades acts against the water, while in the ahead running the flat driving face of the blades gets a better grip or hold on the water.

THE RUDDER

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

Before this edition of THE RUDDER reaches its readers the United States may be at war. The resources of the country will then be taxed to bring that war to a successful termination. Yachtsmen, as they did in the Spanish War nineteen years ago, will again be of material use in the defense of the country, not only because they own a fleet of vessels which can be used for coast defense, or for patrol and scout duty, but because their training as yachtsmen will enable them to handle their boats themselves, and because of their knowledge of the waters where they do most of their yachting they will be of inestimable value for scout and patrol duty.

The Navy Department is planning to build a fleet of power boats for coast defense work and for use as submarine chasers. It will be a comparatively easy matter to get a big fleet of such vessels. One type will be selected and then all the builders will be set to work to turn them out. The trouble will be to find men capable of handling these boats, and that is where the yachtsmen will be of great use. Marblehead yachtsmen, on account of their local knowledge, will be of value in the defense of the entrance to Boston Harbor; New Haven and Newport yachtsmen will be able to patrol the entrance to the Sound from the East; New York yachtsmen will be locally used, and so on all along the coast.

The yachtsman's sport is often regarded as play, and in time of peace it is; but in his play he is storing up a wealth of knowledge for such a time as this, and all yachting being patterned after the Navy regulation, the yachtsman is anxious to do all in his power to help his country in time of need.

Should the United States become involved in war, possibly the most important matter to be attended to at once will be coast defense. It is useless to argue that the enemy fleet is bottled up and that its vessels cannot operate successfully so far from its base. The performances of the submarines Deutschland and U-53 have shown that the latest type of submarine can successfully evade blockades and can cross the ocean. Such boats could seize merchant vessels, transform them into commerce raiders, possibly send a shell or two into some town on the coast, and for a time cause trouble and deal destruction.

To defend the coast against such attacks is the problem that the Navy Department is now solving, and having in mind what the Allies have done with its fleet of patrol boats and the 550 boats built under the direction of the Submarine Boat Company, Henry R. Sutphen, vice-president of the Elco Company at Bayonne, who designed and built the 550 patrol boats for the British Admiralty, was invited recently to a conference with the Navy Department at Washington.

Naval Constructor J. A. Furer, who by the way was the engineer who successfully raised the submarine F-4 which had sunk off Honolulu about a year ago, did much work in collecting data with the idea of forming a fleet of power yachts for patrol duty. Constructor Furer is now in charge of the coast defense work, and admitted that so far the plans of the department have been too vague. The Navy had two patrol boats built, one by Luders and one by Lawley, which were to serve as models for those yachtsmen who wished to own patrol boats. These boats, in their way, are all right, but just now it is necessary to have a fleet built as soon as possible, and the only way to accomplish this is to standardize some model and then place orders with all the yards capable of building such boats.

The Elco Company turned out 550 boats in less than 550 days. Stretched in a line, placing the boats end to end, this fleet would reach more than 8 miles. Each boat was driven by two 250-h.p. Standard engines. The total horsepower was 275,000, and this does not include the engines installed on each boat for lighting and other purposes. The boats were 80 feet long, 12.5 feet breadth and 4.5 feet draught. They can make 19 knots and have a cruising radius of 1,500 miles.

Mr. Sutphen took with him to Washington a complete set of plans and specifications of these boats, which he presented to the department, and offered the services of his company and the experiences of those who had developed this fleet of patrol boats to the Government.

Constructor Furer said the Navy Department intended to prepare plans and specifications of a type of submarine chaser which would be best suited for use in American waters, and would use the plans and specifications of the Elco Company as a basis for developing the type of chaser which the Navy Department would recommend to be built.

While the Navy Department does not ask for excessive speed from the boats in the coast defense vessels and while it is intimated that it may recommend that a fleet of boats be built similar in many respects to those built for the British, it does not mean that the many high-speed boats which have been built for yachtsmen who have been active in the preparedness movement will be of no value to the Government. On the contrary, high-speed boats will be of great value and it is doubtful if there are as many seaworthy high-speed boats in the world as there are in this country.

The Pattina, built by Luders for Charles Ross, fitted with a Duesenberg engine, which averaged 25 miles an hour for eleven hours; the torpedo boat built by the Greenport Company, also driven by Duesenberg engines, which showed 40.4 miles on a trial; the Shadow III and Raven III, equipped with Speedway engines, which have shown 30 miles an hour in races; the Countess and other boats fitted with Van Blerck engines; the Chingachgook

and the boats of her type driven by Sterling engines, are a few of the noted craft which will prove of great value as despatch boats. These engine makers announce that they are flooded with orders and many of the engines that they are building are for boats of similar type to those mentioned, which are for yachtsmen's private use or for use in defense work if they are needed. The yachtsmen, engine builders and boatbuilders are all ready for peace or war.

Although the number of starters in the regattas at Miami was small there was some quality, and the performances of Shadow III and Raven III in the cruiser races showed that there is a steady improvement in the speed of vessels of this type. These two yachts were built by the Purdy Boat Company and each is equipped with two eight-cylinder Speedway engines of 220 h.p. each. In the first race Raven III won. The second and third races went to Shadow III, owned by Carl G. Fisher, and in the third race the time for the ten miles was 19 min. 56 sec., an average of 30.1 miles an hour. The long-distance races are to come now and it will be interesting to watch them when they get outside.

The first of THE RUDDER competitions, that for the fishing boat, will close on March 1st. Those who are figuring on competing in the other competitions have another month in which to perfect their plans. These competitions will develop many new ideas in interior arrangement and the plans will be of much interest to all who make a study of yachts.

The Fitting-Out Number of THE RUDDER is larger and better than it has been for many seasons. It contains articles written by men who know telling how to fit out a yacht and how to avoid troubles. It also contains articles of general yachting interest, and as usual a big list of yachts that are for sale. The outlook for yachting this year is very bright. If it is a year of peace, there will be more racing and cruising than ever. If it is a year of war, then the yachtsmen with their yachts will turn their pleasure into the sterner work of helping to defend their country. No matter what comes, the yachtsman will be busy. Then there is an art supplement, "The Seven Ages of a Yachtsman," which shows seven stages in the career of a yachtsman from the tiny catboat to the rocking-chair fleet.

Mississippi Valley's New Rules

The Mississippi Valley P. B. A. at its midwinter convention made some radical changes in its rules which will tend toward uniformity. It has decided to withdraw cash prizes in the big classes. These cash prizes have in the past been the cause of much trouble between Eastern and Western power-boat men and now that the Western men have done away with the trouble it should eventually mean the getting together of the two associations and the arrangement of uniform racing rules.

The big Western event is the Webb Trophy, a free-for-all, and now there is nothing to prevent a high-speed boat winning that prize and later competing for the Gold Challenge Cup. While cash prizes have been abandoned in the larger classes, they are, however, still retained for the smaller classes. The annual regatta of the Mississippi Valley P. B. A. will be held at Minneapolis, Minn., on July 3d, 4th and 5th.

Herreshoffs Reorganize

The Herreshoff Manufacturing Company, which has turned out many of the fastest yachts in the world in the last thirty years, has been reorganized. Several New York and Boston yachtsmen have formed a syndicate to take over the plant at Bristol and to further develop it. This syndicate is headed by Robert W. Emmons, 2d, of Boston, who is the managing director of the Cup Yacht Resolute. Mr. Emmons has for many years been one of the leading yachtsmen and has owned many fast vessels. Associated with him are Charles Francis Adams, treasurer of Harvard University; George Nichols and other members of the New York Y. C. A. Loring Swasey, of Swasey, Raymond & Page, designers of many of the fastest power cruisers and of the patrol fleet, is now associated with Mr. Emmons in the business end of the work. Mr. Herreshoff and his sons are to remain with the new company. James Swan, former vice-president of the New York Shipbuilding Company, is the new business manager.

Shadow III Wins at Miami

The three-days' racing on Biscayne Bay at the third annual Midwinter Power-Boat Regatta was most interesting. While several boats expected, failed to appear, those that did start were so evenly matched that the thousands who watched the sport enjoyed it thoroughly. It was perhaps appropriate that Carl G. Fisher, to whom the visitors to Miami and the South are indebted for this annual feature, should win the express cruiser race. Shadow III, his latest boat, was built by the Purdy Boat Company at Indianapolis and shipped South. It is 50 feet long by 8 feet breadth and is equipped with two eight-cylinder Speedway engines of 200 h.p. each. Raven III is a boat of exactly the same dimensions and power, and she is owned by Commodore Charles W. Kotcher. Raven III won the first of the series of three races. The other starter in the express cruiser class was Boomerang, owned by Huston Wyeth and driven by a 200-h.p. Van Blerck engine. These boats raced four times around the course of 2½ miles. The Raven's time in the first race was 24 min. 17 sec.

The second race was most exciting. Raven III took the lead at the start, but on the last lap Shadow III closed up and just at the finish forged ahead. At no time during the race were the boats more than four lengths apart. Shadow's time in this race was 20 min. 41⅗ sec., an average of 29 miles an hour. In the third race Shadow III won handily, and this time she did the ten miles in 19 min. 56 sec., averaging 30.1 miles an hour.

The honors in the race for open displacement boats went to Mar-y-cel, a 40-footer, owned by Charles Deering and driven by a six-cylinder Duesenberg engine. Otgadai, owned by J. Fred Betz, 3d, and driven by a six-cylinder Sterling, and Jan II, owned by James H. Snowden, driven by a Speedway engine of 150 h.p., were the other starters. On the first day Mar-y-cel won in 23 min. 52⅘ sec. The course was 10 miles. Otgadai was second. In the second race Mar-y-cel won again and on the last day she won over a 20-mile course in 37 min. 39 sec.

Spokes from the Rudder Wheel

Henry A. Morss is to have his Class R yacht Jack Tar fitted with a Marconi rig and will try out the yacht under this new rig in races off Marblehead this Summer.

* * *

The steam yacht Sialia, built from designs by H. J. Gielow for the late J. K. Stewart, has been sold to Henry Ford and started from New York on a Southern cruise on February 17th.

* * *

Max Fleischmann is having an auxiliary schooner built by Kyle & Purdy from designs by Gielow & Orr. This yacht will be 140 feet long and equipped with Winton heavy-oil engines.

* * *

Adrian Wilson, the well-known sailmaker of Boston, and member of the firm of Wilson & Silsby, died on February 18th. He was in his sixty-fourth year.

* * *

Price McKinney has chartered the steam yacht Cyprus for two months and is now cruising in Southern waters.

* * *

Col. E. H. R. Green visited the power-boat show and placed orders with the Gas Engine & Power Company for four launches, which will be used on the steamer he is now fitting out.

* * *

James Simpson is to make another effort to win the Gold Challenge Cup. He is building a 20-footer from designs by George F. Crouch, which will be driven by one Sterling engine of 250 h.p.

* * *

The Whippet, 60-foot patrol boat, has been sold by Oliver G. Jennings to B. R. Stoddard, of the New Rochelle Y. C. Mr. Jennings is having a larger yacht built by the Greenport Basin & Construction Company, which will be driven by two 300-h.p. Sterling engines. The new boat will be 72 feet long, 12 feet breadth, 3 feet 4 inches draught.

* * *

The steam yacht Surf has been sold by John H. Hanan to Dr. John A. Harriss through the agency of Tams, Lemoine & Crane. This yacht was built in England and was brought to this country by C. K. G. Billings in 1900.

* * *

Hendon Chubb, who last year sold the schooner Queen Mab, formerly Vagrant, has purchased the 40-footer Dolly Bowen. The Dolly Bowen is one of the New York Y. C. one-design class and was built for Alex. S. Cochran. She is to be taken from Jacob's yard as soon as possible to Herreshoff's and there be fitted with a bowsprit, as are the others of this class.

* * *

Charles Coughtry, of Grand View, N. Y., a veteran yachtsman and one of the most successful amateur yacht designers and sailors, died at Morehead City, N. C., January 31st, while on a Southern cruise. He was the second oldest in membership of the Knickerbocker Y. C., having joined that organization in 1880. He was for many years employed by the American Express Company, having entered their employ in 1879 and retired in 1915, the last twenty-five years of his services being in the General Cashier Department of that company.

* * *

Robert Jacob, at City Island, is building a 60-foot cruiser for Henry F. Sinclair, from Hand designs, which will be driven by two Duesenberg engines.

* * *

Read Brothers' shipyard at Fall River, Mass., was destroyed by fire on February 17th. A four-masted schooner under construction was also burned. The total loss amounted to about $250,000.

* * *

W. L. Rich, Jr., of New York, who is interested in the Simplex Company and the Wright-Martin Aeroplane Company, has purchased a fast runabout from the Albany Boat Corporation, which he will use on Upper Saranac Lake. This boat, which is an exact duplicate of two boats building for the Navy Department, will make 36 miles an hour. It is to be equipped with a Van Blerck engine.

* * *

Albert Pach, of the Chicago Y. C., is having a 76-foot express cruiser built by the Great Lakes Boat Building Corporation, at Milwaukee, which it is expected will be the fastest cruiser on the Great Lakes this season. The yacht will be driven by two eight-cylinder, 6¾ by 7¾-inch Duesenberg engines, which will be turned 1,250 r.p.m., developing 340 h.p.

* * *

The steam yacht Warrior has been sold by Alex. Smith Cochran to the British Government. The transfer was made at Kingston, Jamaica, and the Warrior is to be transformed into a war vessel.

* * *

John R. Brophy was elected president of the Gravesend Bay Y. R. A. at the annual meeting of that association. It was largely through Mr. Brophy's efforts that the association was organized some years ago. C. V. Byram was reelected secretary-treasurer and Henry J. Gielow, measurer, was reelected.

* * *

George E. Andrews, who keeps THE RUDDER station at Palm Beach, writes that 800 yachts, mostly power, have passed through the toll-gate of the Florida East Coast Canal this season. Captain Andrews will equip his yard to supply gasolene and other supplies to yachts at once. One yacht recently took on 1,000 gallons in 5-gallon cans.

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THE RUDDER

APRIL
1917

HARBOR PATROL BOAT



42-Foot Trident Model

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PUBLISHED AT
TWO HUNDRED AND FIFTY-FOUR WEST THIRTY-FOURTH STREET
·NEW YORK CITY·

PRICE TWENTY-FIVE CENTS.

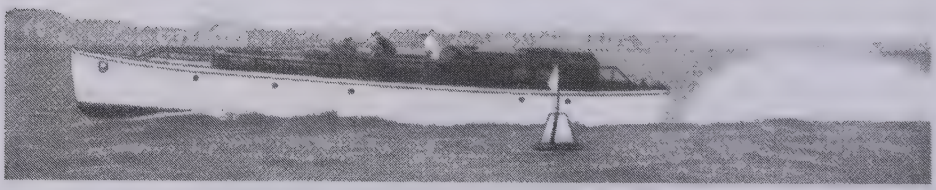
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Supplement to The Rudder

WILLIAM ZIEGLER JR.'S S. Y. GEM

A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII April, 1917 No. 4

"My Country, 'Tis of Thee"

Yachtsmen Working Actively with the Navy for Coast Defense

Preparedness

THE coast-line of the United States measures 21,862 miles according to the U. S. Coast and Geodetic Survey. This is divided 11,679 miles Atlantic Coast, 6,418 Gulf Coast and 3,765 Pacific Coast. This length does not take in Alaska or outlying possessions, such as Porto Rico, Panama Canal Zone or the Pacific Islands.

To have this enormous coast properly patrolled and protected will require a huge fleet of patrol boats and cruisers. Some pacifists may say that it is not necessary to guard every inch of land and that only in the vicinity of the large cities and the entrances to the important harbors and the mouths of the larger rivers really need guarding. It is probable that with the most elaborate program for defense this is all that can be done, but vessels will have to be continually patrolling the entire coast-line or the enemy easily will be able to establish a base in some sheltered and secluded harbor.

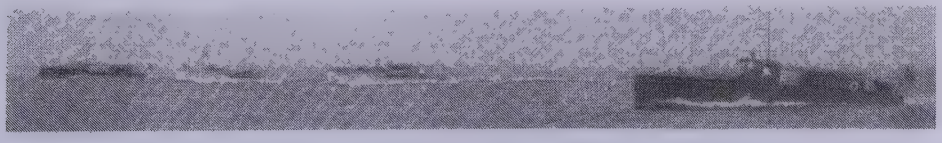
Submarines may be able to carry sufficient fuel to enable them to cross the Atlantic and to keep away from their main base for several weeks, but submarines have to recharge their storage batteries in order to enable them to run below the surface, and to recharge an electric storage battery it is necessary to come to the surface because the gasolene engine cannot be run while the vessel is submerged because of the fumes it gives off, and to attempt to recharge a storage battery without proper ventilation would endanger the lives of all on board because of the hydrochloric gas.

To defend this huge coast-line consequently presents two difficulties. The first is, to obtain the fleet of vessels fitted for the purpose, and the second, is to find the men to handle those vessels.

It may perhaps at present be easier to find the vessels than the men, and to overcome these two apparent difficulties the Navy Department, aided by several public-spirited citizens, who have for a long time seen the necessity of preparedness, are now devoting much attention.

About a year ago the Navy Department realized the danger into which the country was drifting. The officers in high responsible positions in the Navy understood more than anyone else the necessity of preparation, and these men also appreciated that in case of hostilities the yachtsmen of this country would be of inestimable value, first, because of the vessels they owned, and then because of their local knowledge of the waters washing the long coast-line. The yachtsman has the advantage over the Navy officer in three ways. He has a local knowledge which the naval man cannot have; he is able to handle a small vessel better than a naval man, and he has a practical knowledge of the gasolene engine which the naval man has not.

England and the Allies have made practical use of the yacht, not only the steamer which could be used as a gunboat or small cruiser but of the power craft, and the large pleasure fleet has been impressed into service.



Power Yachts Maneuvering With Naval Vessels

A Naval reserve has been organized. The owners of the yachts, after passing examinations and showing proper qualifications, received commissions and have handled their own yachts in the coast patrol work. Other yachtsmen have helped make up the crews and the yacht sailor too has been used in this work. Not satisfied with their own yachts and with a large fleet of vessels that have been built in the home yards, the British, Russians and Italians have come to builders of this country for patrol boats and for engines. The Russian boats were built at Greenport, and others built in Russia were equipped with American engines. The British and Italian boats were built in Canada under American supervision and at Bayonne, and engines have been shipped from several of the large manufacturers to the British, Italians and French for vessels that have been built at home.

THE RUDDER was the first of the publications devoted to yachting to call attention to the importance of enrolling the pleasure fleet and the yachtsmen for use when needed. A year ago Naval Constructor Furer told the yachting public through THE RUDDER of the plans of the Department, which were practically to card index every yacht and every yachtsman. The plan was to have a complete record made of all the yachts and tabulated with this the speed of each vessel, what would be necessary in the way of strengthening to enable it to mount guns, its cruising radius, number of men accommodated and to what part of defense work it was best suited.

A lot of that work was done and is now of great value; but the wheels of a government by the people move slowly and it was not until the Naval Bill of last year was finally passed that the Department had the power to organize a Naval Reserve or to enroll yachts or yachtsmen for the purpose of defense.

In the meantime several yachtsmen organized the Naval Training Cruise Civilian Committee, and this committee was successful in getting the Navy Department to allow civilians to make a month's cruise on battleships for the purpose of training them in seamanship and in general naval instruction. This cruise was very successful, 2,300 civilians taking the four-weeks' course at sea, and it ended with maneuvers in which power yachts were used to protect the coast from an imaginary enemy and in submarine chasing.

Several other yachtsmen purely out of patriotism organized what was known as the Patrol Squadron. Five 40-footers formed the original squadron and these were owned by Steuart Davis, F. B. Humphrey, Landon Humphries, John Neilson and Roland C. Nickerson, and later Ernest Rogers, Orson D. Munn, Hermann Oelrichs and H. S. Vanderbilt built boats and joined in the movement. This squadron did such good work and its members proved so efficient that it has been enrolled in the Second Naval District, which extends from Chatham on Cape Cod to New London.

Early this Winter the Power Craft Association was organized, with Arthur Curtiss James as president, and after that came the Long Island Association, and others have been organized at Boston and at Philadelphia.

But all these organizations without some real head would be of little help, and the Department has taken hold of things with a vim which will soon result in a very effective fleet, well equipped and properly manned, being ready for any emergency.

To harmonize all the different organizations and to prepare properly for the defense of this country a meeting of yachtsmen, towboat owners, captains of vessels, engineers, and railroad men was held at the New York Y. C. house on February 26th. Assistant Secretary of the Navy Franklin D. Roosevelt and Rear-Admiral Nathaniel Usher, commandant at the New York Navy Yard, told those present of the need of a mosquito fleet.

Those present at this meeting included Arthur Curtiss James, Vincent Astor, P. A. S. Franklin, president International Mercantile Marine; Commander J. B. Patton, who is aiding Rear-Admiral Usher in the preparation for the defense of the Third District; Lieutenant-Commander R. P. Craft, Captain Louis A. Kaiser, Robert E. Tod, Henry S. Beardsley, Leonard H. Dyer and Captain T. P. Magruder, in charge of the Naval Militia and reserve organizations.

The towing concerns were represented by Eugene Moran, of the Moran Towing Company; Richard Barrett, of the Barrett Towing Company; Captain McLeod, of the Chapman Derrick and Wrecking Company; Mr. Wheeler, of the Henry Steers Company, and Captains Patten and Netland, of the Yacht Masters' and Engineers' associations, while others included Captain Luther B. Dow, of the American Steamship Licensed Officers' Association; T. R. Delehenty, secretary of the Marine Engineers' Benevolent Association; Timothy Healy, Coroner and president of the Eccentric Firemen's Union.

The railroads were represented by W. H. Averill, general manager of the Baltimore and Ohio; Captain J. M. Cherry, marine department, Lehigh Valley; D. C. Chase, Pennsylvania system; Henry L. Joyce, of the Central Railroad of New Jersey; Walter H. Pollack, New York Central; A. C. Renshaw, Standard Oil Company, and John M. Emery, Lackawanna.

Others present were W. Butler Duncan; H. E. Boucher, treasurer, Power Craft Association; Steuart Davis, Orson D. Munn and Loring Swasey of the patrol squadron; Commodore Jacob W. Miller, of the New York Naval Militia; Captain Charles L. Poor, commanding First Battalion, Naval Militia; C. F. Chapman, of the United States Power Squadron; Stoddard Hancock, who has just entered the Navy and John H. Barnard, secretary of the Power Craft Association.

Mr. Roosevelt, in his speech, said that 750 power boats and 10,000 men would be necessary to adequately defend the American coast in this vicinity in case of war with Germany. This force would be needed to patrol the Third Naval District, which includes the coasts of New York and New Jersey.

"We want action now, not a month from now," said Mr. Roosevelt, as he urged upon his hearers the necessity for cooperation with the Navy Department. He said, in part:

> The Navy has not sufficient power craft or men to protect our coasts. The Navy knows exactly what it needs, but has now reached the point where little more can be accomplished without the active aid of those in civil life who are willing to devote their time and energy in assisting the Navy in preparation for war. There is at present an opportunity for real service to the Navy and the country.
>
> For the defense of the New York District alone there is needed an unlimited number of yachts, power boats, tugs and small craft. We need at least 750 such vessels and 10,000 men for the New York District alone. These volunteers will be listed in service with the Naval Volunteer force. Fortunately the Act of Congress on August 29th last, has given a very elastic opportunity for service in the Navy to all who really wish to serve in and with that branch of the service in any capacity. Accurately speaking, there is no obligation whatever on those who enroll either their vessels or themselves in the Naval Reserve for any service in time of peace. The sole obligation



Viking, Commodore Geo. F. Baker Jr.'s Steam Yacht Which He Has Offered to the Government

for service is that the boat and personnel enrolled are obligated for service in time of actual or imminent war.

The Third Naval District, including, as I have said, New York, could use 1,000 boats. You can see the enormous amount of detail work to enroll such a force. For that reason assistance is necessary, and we are calling on yacht clubs, maritime associations, training associations, engineering societies, shipping concerns, etc., to come to our help, and at once. There is no other way to reach the personnel desired.

I have said that we want at once 750 boats, but I have no doubt that the Navy Department will take 1,000 if they are to be had. We want particularly the biggest and most seaworthy boats that we can get for mine laying, mine sweeping, transportation of and planting of nets, patrolling and scouting and other important work; work that for the most part will have to be done offshore. Some boats will have to be able to operate 100 miles off the coast and others at a greater distance, in some instances perhaps 400 or 500 miles, and one of the big problems before us is to get a large enough fleet of these big seagoing boats.

Then we will need the fleet of smaller boats for duty in the Hudson and East Rivers, in the Lower Harbor and at the head of the Sound.

You gentlemen who have yachts usually put them in commission about April 1st, I know. I am going to ask you, even if you do not volunteer them at once, and even if they are not called upon at once, to put them in commission at the very earliest moment, for we cannot tell when they will be needed. It will mean putting them in shape only about a month in advance, and I believe that the urgency of the situation demands such action. The quicker the better.

The Naval Training Association of the United States has undertaken the work of obtaining this fleet of vessels and the men to handle it and is working with the officers of the Navy. The headquarters of the Association is 26 Cortlandt Street, New York, and there are other committees in Boston, Philadelphia, and other large cities. Secretary of the Navy Josephus Daniels is the honorary president of the Association and the honorary vice-presidents are: Herbert L. Satterlee, W. Butler Duncan, Ralph Pulitzer, Andrew J. Peters and Alexander Van Rensselaer.

The Executive Committee is: George F. Baker, Jr.; Paul L. Hammond, Thomas Newhall, John L. Saltonstall, F. H. McAdoo, William Greenough, W. Frazier Harrison, Richard S. Russell, D. McKee Morris, Martin Lindsey, R. W. Emmons, 2d; Junius S. Morgan, A. H. Kelly and D. W. Hoegg, Jr.

The Finance Committee is: Gordon Knox Bell, Harold S. Vanderbilt, Junius S. Morgan, John L. Saltonstall, Arthur Curtiss James and E. Walter Clarke.

Charles Longstreth Poor, Captain of the Naval Militia, is the executive secretary, and Walter Scott Meriwether is the publicity manager. The Governing Committee is a large one and also very representative. It includes some of the best known and most active



Corsair, Vice-Commodore J. P. Morgan's Yacht, Which Will Be a Gunboat

yachtsmen in the country and all parts of the country are represented. It is as follows:

Ralph Kingsley, Bar Harbor	H. S. Vanderbilt, New York
Frank J. Sullaway, Concord	M. J. Harrington, New York
A. Loring Swazey, Boston	E. S. Willard, New York
H. Parkman, Jr., Boston	Fred P. Humphreys, New York
Edward M. Pickman, Boston	Thomas W. Slocum, New York
R. W. Emmons, 2d, Boston	Orson D. Munn, New York
John L. Saltonstall, Boston	Steuart Davis, New York
Edgar Pierce, Boston	Charles Bradley, Morristown
Nat. F. Ayer, Boston	Lewis B. Stillwell, Lakewood
Henry A. Morse, Boston	D. McKee Morris, Pittsburgh
John Parkinson, Jr., Boston	W. F. Harrison, Oreland, Pa.
Arthur Adams, Boston	W. L. Rowe, Pittsburgh
Franklin Farrel, New Haven	Malcolm McGiffen, Pittsburgh
M. D. Halliday, Ithaca	Chas. W. Brown, Pittsburgh
P. M. Hamilton, Sterlington	J. H. Craige, Philadelphia
Harper Sibley, Rochester	Thomas Newhall, Philadelphia
Conger Goodyear, Buffalo	W. B. Henry, Philadelphia
Stewart Waller, New York	Chas. Longstreth, Philadelphia
F. H. McAdoo, New York	F. M. Gardiner, Philadelphia
F. O. Byrd, New York	Sydney Clark, Philadelphia
W. C. Booth, New York	Edward B. Smith, Philadelphia
Paul L. Hammond, New York	Redmond Stewart, Baltimore
William Greenough, New York	A. H. Kelly, Richmond
Junius S. Morgan, New York	Oscar H. Cleveland, Memphis
August Belmont, Jr., New York	Rudolph Siegling, Charleston
W. Butler Duncan, New York	Arthur Gordan, Savannah
Templeton Briggs, Cincinnati	Robt. S. Marx, Cincinnati
Martin Lindsey, Milwaukee	Foster Symes, Denver
Edmund H. Eitel, Indianapolis	Sterling Morton, Kansas City
Don. P. Hawkins, Indianapolis	Shirley Ford, Gr't Falls, Mont.
Samuel Insull, Chicago	H. Corbett, Portland, Ore.
John M. Ewen, Jr., Chicago	Benj. Dibblee, San Francisco
Ogden McClurg, Chicago	Ray. Armsby, San Francisco

In order to perfect the organization Rear-Admiral Usher has divided the Third Naval District into several smaller districts and has put some influential yachtsman in charge of each district. These yachtsmen are tabulating the yachts in each district and obtaining the names of those who are willing to enroll for service in case of war. In other Naval districts similar action has been taken and already there is a big list of power boats whose owners are willing to turn them over to the Government should they on inspection show that they are useful in some capacity or other.

The Department has announced the uses to which power boats can be put as follows: Harbor defense patrol, mine field patrol, coast patrol, dragging for mines, despatch duty, searching for and attacking submarines, cooperation with submarines, cooperation with air-craft, cooperation with land forces in defense of district. It will be seen that there are many duties for a power boat and necessarily some will have to be stauncher and more speedy than others. While the Navy Department has specified the sizes and speeds of boats best suited to the defense work, it does not mean that those boats that do not comply with these requirements are ineligible. On the contrary the authorities are asking everyone who owns a power boat, no matter what its size or speed, to list it with the Department or with the committee of the Naval Training Association, and the inspectors will determine whether it can be made serviceable.

Four types were specified by the Department and the highest speed required is 16 knots. These types are:

Type A slow—Length not less than 40 feet; sufficiently seaworthy to maintain station in harbor in all weather up to a moderate gale; speed, not less than 7 knots; to be self-sustaining for four men for four days and to be equipped with a one-pounder and one machine gun.

Type A fast—The same as the slow A type but the minimum speed to be 16 knots.

Type B slow—Length at least 60 feet; able to keep the sea in a moderate gale. Minimum speed, 10 knots; self-sustaining for five days with a crew of eight men; armament, one anti-air-craft gun fitted for horizontal fire as large as possible, not less than a 3-pounder; and at least two machine guns; to be equipped with radio and searchlights.

Type B fast—The same as the slow B type but the minimum speed to be 16 knots.

Since these suggestions were made several yachtsmen have ordered boats which are now being built and which are to be completed as soon as possible. Some of these will be of the high-speed express cruiser type and they will have much more speed than the Navy officials place as the limit minimum for the fast offshore boats. Last



Noma, Vincent Astor's Steam Yacht, Was One of the First Offered for Naval Duty. 262 Ft. 5 In. Long, 26 Ft. 6 In. Breadth, 15 Ft. 6 In. Draught, Built From Designs by Tams, Lemoine & Crane in 1902



Model of the 45-Foot Patrol Boat Built by Lawley for the Navy Department. Model Built by H. E. Boucher Manufacturing Company

year two boats were built for the Navy, one 45 feet long and the other 66 feet long. Builders were invited to submit designs and specifications and the Luders Company secured the contract for the 66-footer which is to make 30 miles an hour, and the Lawley Corporation built the 45-footer which is to make 25 miles an hour. These two boats were built in order to give yachtsmen who were willing to build, an idea of what the Navy Department thought the best types for patrol or scout work. Ralph Pulitzer, who is enthusiastic for the development of the mosquito fleet, is having one of the 66-footers built by the Luders Company. Models of these two boats have been made by the H. E. Boucher Company and they were displayed at the last power-boat show. These models are built to scale and show every detail of the boats and their equipment. Photographs of the models are printed in this issue of THE RUDDER. The lines were printed some months ago. Since these two boats were built the Naval experts have somewhat changed their minds as to the best type for use as submarine chasers, and builders and designers have been asked to submit their ideas to the Department and a new design, embodying some of the good features of those submitted, has been developed.

The Department has planned to build 110-footers. Fifty are to be built at once in the New York Navy Yard. Contracts have also been placed with several yards in different parts of the country for two hundred more. These boats will be built of steel and will be driven by internal-combustion engines. They are to make 18 knots and to show that speed in a run of two hours, and are to maintain a speed of 12 knots for 24 hours. This speed is regarded by many as a retrogression. Many naval men and others who are competent



Model of the 66-Foot High-Speed Patrol Boat Built by the Luders for the U. S. Navy. Model by Boucher

to express opinions say that the speed should be at least 22 knots and that 25 knots would be better. These men, too, are satisfied that it would be a comparatively easy matter to attain a speed of 25 knots with gasolene engines nowadays, and they point to what many of the so-called express cruisers have done.

Two boats, one for William duPont and the other for Commodore Robert E. Tod, are being built at Herreshoff's, which are thought to be ideal in design and arrangement. These boats are building of steel and are to make 22 knots. Work on them is being rushed and the work on the other boats is to be hurried so that after two months they can be delivered very fast and the fleet be complete in five months.

In developing this submarine chaser the Department first took the plans of the 550 boats built for the British by the Elco Company. These boats are 80 feet long and are driven by two Standard engines of 250 h.p. each. They can make 19 knots and have done excellent work.

The plans of other power boats that have been built for service abroad, such as those of the Greenport Basin Company and the Lawley Corporation, have also been studied, together with plans which were submitted by several of the leading designers of the country with some practical suggestions made by yachtsmen who have studied the situation.

Naval architects seem to differ somewhat in their ideas of what a submarine chaser should be. Frederick M. Hoyt, of the designing firm of Wm. Gardner & Co., thinks it should be 150 feet long, built of steel, driven by steam engines and be able to make 25 knots. He says submarines can now make 22 knots, at least reports from the other side say so, and a 19 or 20-knot boat cannot catch one that can go 25 knots.

Henry J. Gielow thinks about 100 feet the proper length and he favors a speed of 20 knots obtained with gasolene engines. He favors a staunch seaworthy boat able to stay out several days, go well offshore and one that is well armed.

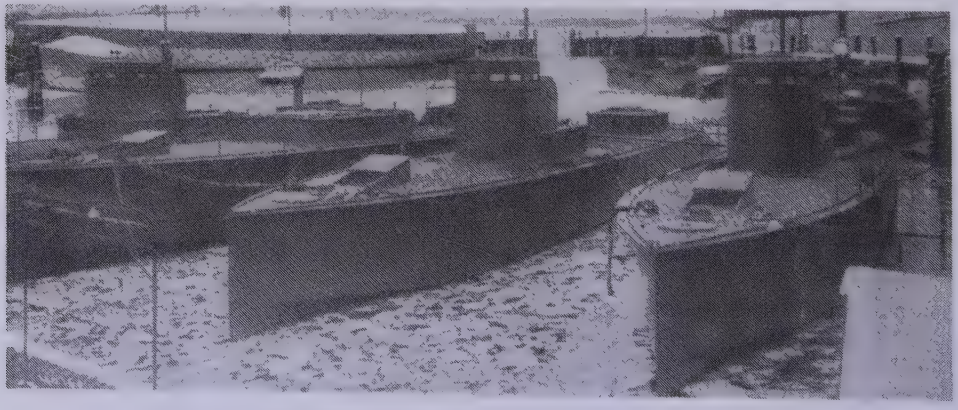
George F. Crouch and W. Washburn Nutting, the experts of *Motor Boat*, have collaborated on a design which is printed on another page of THE RUDDER. This boat is 85 feet long, makes from 18½ to 21½ knots according to the power installed, and has a cruising radius at reduced speed of 1,500 miles. This boat is built of steel and has many very attractive features. The accommodations too are commodious and comfortable.

Charles D. Mower writes: "It is difficult to say just what type of boat will be best suited for patrol work and defense against hostile submarines. About a year ago my firm, Bowes & Mower, received an order for a power boat of the scout patrol type and the owner's chief requirement was that the design should be approved by the Navy Department before the boat should be built. After several conferences with Admiral Taylor and other officers of the Navy Department, plans were prepared, submitted and received the approval of the Department.

"At that time speed was considered very important and a speed of 28 to 30 statute miles was required. The boat was also required to be able to stay at sea under all conditions and to maintain a speed of over 20 miles in rough water. For armament she must carry a 3-pounder forward and a machine gun aft. The Zenith, S. P. No. 61, owned by Commodore Longstreth, Corinthian Y. C., of Philadelphia, is the boat built from this design and at the time of writing, she has been launched but is waiting on the engine builder for her trial trip.

"Since Zenith was designed the ideas of the Navy Department seem to have changed toward a larger boat of heavier displacement, less speed and able to stay longer at sea. It is probable that the Department considers the larger boat desirable as a better gun platform for there is little use in having a 3-pounder on a boat that is so lively and quick in rough water that it would be impossible to score a hit. This in my opinion is the chief reason why the majority of so-called scout patrols would be of absolutely no military value in actual service even admitting that they are structually strong enough to fire their gun without tearing their decks off. A Navy 3-pounder weighs, with mount, about 1,605 lb and has a deck pressure, with 5-inch recoil, of 7,500 lb per square foot. This needs something more than a ⅞-inch canvas covered deck with a few wooden struts under the beams.

"One serious problem with the 30-mile gasolene boat is the difficulty of getting competent men to handle the engines—assuming that engines can be obtained that



The Russian Patrol Boats Built by Greenport Basin & Construction Company



M-1, U. S. Submarine, 200 Ft. Long, Built by the Electric Boat Company

will stand up to hard actual service. Even with speed reduced to 18 or 20 miles and a heavier type of engine adopted there is still the problem of competent engineers to be met.

"In view of the difficulty of getting men and the lack of reliability of gasolene engines it is not unlikely that the Government will go to high-speed steam engines with oil-burning, water-tube boilers. Boats of over 100 feet over all will undoubtedly be of the greatest value for submarine defense, although I believe that the 30-mile boats of 70 to 80 feet will be of great service for scout service working with the larger and slower boats.

"A trip down the beach from Absecon to Cape Charles in a heavy Nor'wester last January in a 50-foot express cruiser was all that was necessary to convince me that a boat under 70 feet is too small to be of any real service offshore in bad weather, and the average yachtsman does not stop to think that real service offshore in Winter is a very different proposition from fair weather yachting in July and August.

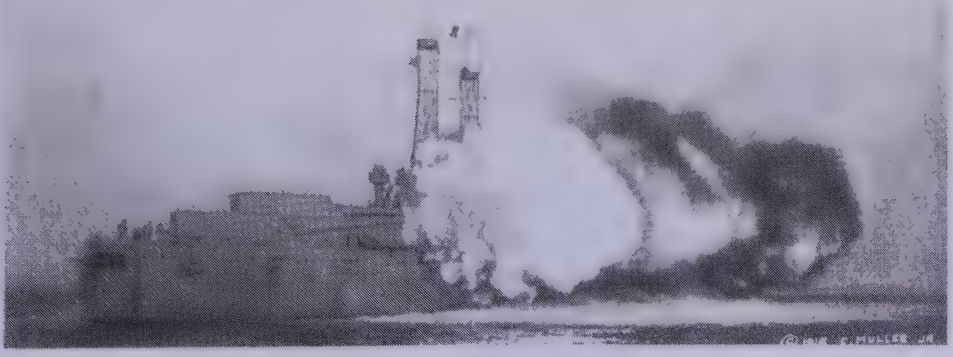
"I believe the best boat for submarine defense would be a boat of not less than 20 knots speed, not less than 100 feet length and 15 feet breadth, built of steel and driven by gasolene or internal-combustion oil engines of a fairly heavy-duty type. She must be a round bilge type and designed to be an easy roller in rough water and have as much displacement as possible for the necessary speed with such power as available.

"The worst feature of the whole situation is that we have talked 'preparedness' and done nothing except to build boats and engines for the foreign governments until now we are up against the prospect of immediate need of a fleet of at least 200 or 300 boats and it will in all probability be at least a year before even one-half the necessary number can be built and from three to four months before even the first boat is ready for service."

Everyone seems agreed that for real offshore work a boat 100 feet long or over is required and while there is some difference of opinion as to the power—steam or gasolene—the advocates of the former seem to have overlooked one important thing.

In the United States today there are a great number of firms manufacturing heavy-duty gas and heavy-oil engines which would be suitable. In fact, the whole trend in the commercial field has been toward the replacement of steam engines with the above.

With the industry in this condition it would take but very little organizing to supply the necessary number of engines in the shortest possible time—we believe even before the boats would be ready for them.



U. S. S. Dreadnought Arkansas Firing a Broadside With Her Twelve 12-In. Guns. 554 Ft. Long, 93 Ft. 2 In. Breadth, 28 Ft. 6 In. Draught. 27,243 Tons Displacement, Speed 21.05 Knots

The Naval Reserve Force

BY an Act of Congress, dated August 29, 1916, there was created a Naval Reserve Force. In establishing the Naval Reserve Force the intention was to systematically enroll those citizens of the United States whose experience or qualifications, together with some training, would fit them for service with the Navy or in connection with the Navy in time of war or national emergency, and to give this training so as to interfere as little as possible with the civil pursuits of those enrolling. This Reserve Force is divided into six classes, as follows: Class 1, The Fleet Naval Reserve; Class 2, The Naval Reserve; Class 3, The Naval Auxiliary Reserve; Class 4, The Naval Coast Defense Reserve; Class 5, The Naval Reserve Flying Corps; Class 6, The Volunteer Naval Reserve.

The Fleet Reserve applies only to men who have had naval service. Enrollments in classes 2, 4, 5 and 6 are under the direction of the commandants of the various naval districts. Class 2 is composed of those who have been engaged in the seagoing profession. Class 3 is composed of men and officers serving on board American merchant vessels. Class 5 includes officers and men transferred from the Naval Flying Corps, graduates of the Aeronautic School and civilians skilled in air-craft. Class 6, the Volunteer Naval Reserve, is composed of those men who will serve in a special class without retainer fee.

The Naval Coast Defense Reserve, Class 4, is what yachtsmen are mostly interested in. It will include those citizens who are capable of performing special useful service in the Navy or in connection with the Navy in defense of the coast. This class includes men skilled in the management and operation of power boats and other harbor craft, such as amateur or professional yachtsmen, masters, engineers and men of local commercial craft of the several naval defense districts, as well as those employed on tugs, fishing vessels and dredges in such districts; also radio operators, electricians, men skilled in mechanical arts, such as machinists, blacksmiths, boilermakers, pipe-fitters, coppersmiths, ship carpenters, riggers, riveters—in fact, all men of special skill who may be useful to the Navy in time of war or national emergency; also superintendents and foremen in each of these several lines of industry who may in time of war or national emergency replace the seagoing men of the Navy now filling such positions ashore. Previous experience on the water is not, however, required for enrollment in this class. Men of administrative, scientific or executive experience capable of useful service in connection with the supply, inspection, intelligence and communication departments of the Navy should enroll in this class. In connection with Class 4, it is requested that men whose preference would be for work afloat or ashore in connection with the Navy in time of war apply for further information, whether they have had previous experience or not. A member of Class 4 cannot be called on for service in the active or reserve fleet, and it is understood that it is not the intention of the Navy Department to call on a man for service, except in the naval district in and for the duties for which he has enrolled, but he may in time of peace be transferred upon his own application to another class of the reserve if he is qualified, and may in time of war volunteer for and be assigned to duties which the commandant of the district may deem him competent to perform.

Owners and operators of yachts and power boats suitable for naval purposes in defense of the coast may be enrolled in this class, and contracts made with such owners to take over their boats in time of war or national emergency upon payment of a reasonable indemnity. It is understood to be the intention of the Navy Department as far as possible to enroll the owners and crews of such suitable boats as units, giving the owners, where qualified, provisional rank and the command of their boats, and the crews appropriate rating.

To be eligible for enrollment in any one of these classes, it will be necessary to furnish satisfactory evidence as to ability, character, and citizenship. When first enrolling, a provisional rank or rating is given the reservist and after three months' active service taken in



The New Battle Cruisers for the U. S. Navy, Contracts for Which Have Recently Been Awarded, Will Be 850 Ft. Long, 91 Ft. Breadth, Displace 34,600 Tons and Make 35 Knots. They Will Mount Ten 14-In., Eighteen 5-In., Four 3-In. Anti-air-craft and Have Eight Torpedo Tubes. The Horsepower Will Be 180,000

periods of not less than three weeks, he may be confirmed in his rank or rating.

Both officers and men upon first enrolling receive retainer pay of $12 per annum and upon being confirmed in their rank or rating they receive, as retainer pay, per annum, two-months' base pay of the corresponding rank or rate in the Navy.

Members who re-enroll for a term of four years within four months from the date of termination of their last term of enrollment and who shall have performed the minimum amount of active service (three months) during preceding term of enrollment shall, for each such enrollment, receive an increase of 25% of their base retainer pay. (Base retainer pay is two-months' base pay of the rank or rating in which serving.) When actively employed, the pay of the officers and men in the reserve shall be the same as that of the officers and men in the Navy of similar rank or rating. The retainer pay is also in addition to the active service pay.

When first reporting for duty in the Reserve Force, officers receive a uniform gratuity of $50, and men $30. In time of war this allowance is increased.

While no active service is obligatory in time of peace, three-months' active service is the minimum amount required in each enrollment (an enrollment being for four years), and is to be taken in periods of not less than three weeks, if confirmation in rank or rating or retainer pay is desired.

Enrolled members shall be subject to the laws and regulations of the Navy only during such time as they may be on active service at their own request.

Provision has been made that the ranks and ratings in the Reserve Force shall correspond to those in the Navy, up to and including the rank of Lieutenant-Commander.

The method of paying for service in the Reserve is as follows: Retainer pay is sent to the member from the Disbursing Officer at Washington, D. C., and is forwarded to the member every three months. The active service pay is paid to the member by the Paymaster of the Station or vessel on which the active service is performed.

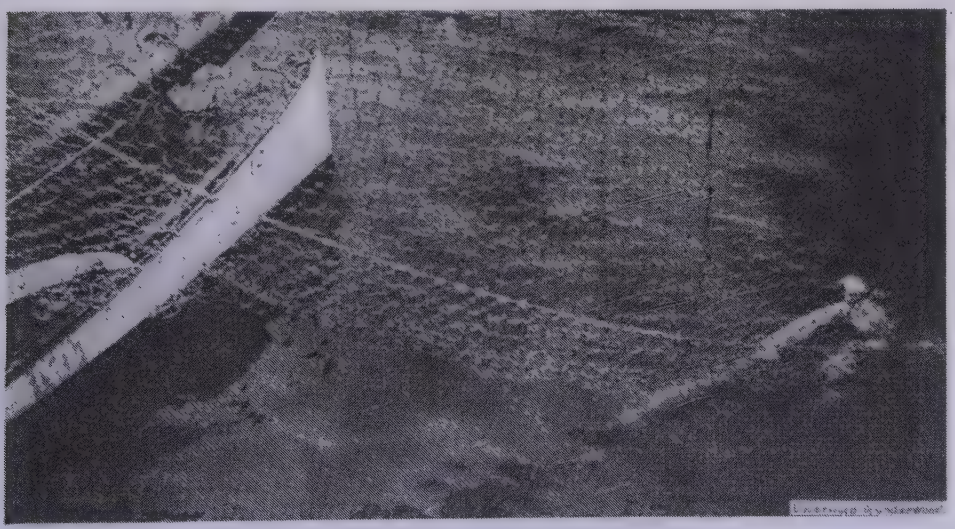
In time of peace, when no national emergency exists, men shall be discharged upon their own request, upon reimbursing the Government for any clothing gratuity received.

Walter Scott Meriwether, an authority on Naval matters, speaking of the requirements of this district, says:

The number of men needed approximates the number comprising the regular Navy at the outbreak of the Spanish War. Realizing that it is facing a very big problem in getting together so many men and enrolling so large a fleet of privately owned vessels, the Navy Department is now actively engaged in a plan to coordinate the energies of civilian organizations so as to prevent duplication of effort and to work towards a higher plane of general efficiency.

The body which has been most active in this work is the Naval Training Association which last year fared to sea as the "Navy Plattsburg," and whose disrupted plans for another battleship cruise this Summer have now been tentatively changed to one involving Summer camps. While these plans are in abeyance the Association has been devoting its energies to the work of enrolling volunteers for the Coast Defense Reserve and for the Naval Reserve. The Association has a numerous membership and its members are doing all that energy, influence and intelligence can accomplish towards swelling the number of men who could be made immediately available for the defense of the nation.

No one can forecast what will happen with the breaking of the thin partition between armed neutrality and open war. Nine nations are aligned against Germany and her allies. America has a coast-line extensive as that of the Continental Entente Allies. One of these has reserved to herself the title of "Mistress of the Seas". Her Navy is so far superior to ours that there is no comparison. Yet in the effort to guard her relatively insignificant coast-line, Great Britain has found it imperative to commandeer into her incomparable Navy upwards



Heavy Steel Nets Are Used to Guard Harbors in the War Zone and Are to Be Used on This Coast if Necessary. The Photograph Shows a Torpedo Caught by Its Propeller in the Meshwork and a British Power Patrol Boat Lifting the Net to Remove the Torpedo

of 4,000 privately owned vessels—mainly trawlers, yachts and power boats, an auxiliary upon which she largely depends for keeping her sea lanes open.

But with all of her vast preponderance of sea power, Great Britain has failed to control the operations of enemy submarines and no one knows how many of this evil brood are in readiness to strike at our own coast and no one can foretell the havoc which a score or so of these raiders could bring about.

Of all weapons of modern warfare, the submarine is the most baffling. We have a few submarines of our own, but you cannot send a submarine to fight a submarine. The most effective defense is the destroyer, but we have only seventy-four to guard an enormous coast-line, while Great Britain with more than two hundred found that much greater number wholly inadequate for the protection of her infinitely smaller littoral. And as she in her hour of stress turned to her yachtsmen and her fishermen for aid, so America must now needs invoke assistance from the same type.

In the Third District, in which is New York, the work of enrollment is progressing well. Yachts are being inspected and their qualifications noted, and hundreds of yachtsmen and others who have had some experience in boat handling are being enrolled for service. There are several sections of this division, in each of which there are hundreds of men who are familiar not only with small boats and boat handling, but many of them are practical navigators and are thoroughly familiar with the local conditions and are competent to act as pilots. Among these sections might be mentioned, the Great South Bay, Jamaica Bay, New York Harbor and Gravesend Bay, the Hudson River and Long Island Sound. Rear-Admiral Usher and several of the leading members of the Naval Training Association have recently addressed meetings of yachtsmen, fishermen and others, urging them to join in this preparedness movement, and they have been very successful. At one meeting attended by Rear-Admiral Usher at Sheepshead Bay more than three hundred at once pledged their services to the Government "in any capacity that may be necessary to protect life, liberty and property."

The work of procuring the crews will be harder than getting the boats. In several of the districts the enrollment has already been large, but one trouble that is proving a stumbling block is that the majority of those offering their services wish to be officers. As a matter of fact comparatively few are competent to be officers. They may know about boat handling and navigating in local waters but to handle a patrol boat requires more knowledge than handling a yacht. The commander of a patrol boat will have a very responsible position—not only responsible by the work he will have to do but the lives of his crew of ten to twenty men will depend on his judgment. In the National Guard men have enlisted as privates and they have later on worked up to commission rank. The patriotic yachtsman will be content to "do his bit" as a private and earn promotion.

Many yachts have already been offered and accepted by the Government. Vincent Astor as soon as there was a possibility of trouble placed his steam yacht Noma at the disposal of the Government. Commodore George F. Baker offered his steamer Viking free of all cost. Vice-Commodore J. P. Morgan has placed the Corsair at the disposal of the Government and other yachts offered free of expense are Mrs. Edward H. Harriman's Sultana, John Borden's Kanawha, Mrs. John S. Kennedy's Cherokee, William D. Guthrie's Meudon, Frederick A. Schermerhorn's Freelance, and George C. Sherman's Rana. The Corsair is the largest of this fleet. She is 304 feet long over all and displaces 1,136 tons. At the outbreak of the war with Spain the late J. P. Morgan turned his old yacht Corsair over to the Navy and known as the Gloucester she did good work when the Spanish squadron was destroyed.

Enrollment blanks can be obtained at THE RUDDER office, 254 West 34th Street, and they will be mailed to anyone who sends a request.

The headquarters of the Second District is at Newport and Commander Steuart Davis, of the Patrol Squadron, which is now enrolled in the Second District, is attending to enrollment there. Lieutenant Orson D. Munn, the secretary of the Patrol Squadron, has opened an office in the Woolworth Building and receives applications there from those who wish to be allied with the Second District, which extends from Chatham to New London.

The First Naval District extends from Eastport, Me., to Chatham, and Captain W. R. Rush, commandant of the Charleston Navy Yard, is in charge. In this district 500 power boats and 5,000 men are asked for and the work of finding these boats is in charge of a committee, of which Robert W. Emmons, 2d, is chairman, and the other members are Nathaniel F. Ayer, H. K. White, Richard S. Russell and Commander Raymond D. Hasbrouck, U. S. N. Meetings have been held and the yachtsmen have entered heartily into the plans to enroll not only their yachts but themselves for defense. A census is being made of all the vessels suited for patrol work or scout duty, and as the fleet of yachts owned in this district is quite large the organization of several squadrons for different duties will soon be completed.

The Delaware District extends from Barnegat Bay to Virginia. Already several boats have been enrolled with Commander C. P. Nelson, U. S. N., the most important of which is Scout Patrol No. 61, owned by the Commodore of the Corinthian Y. C., of Philadelphia, from designs by Bowes & Mower. This boat was launched March 14th and is very nearly completed. The plans were first submitted to the Navy Department and were approved before the contract for building was placed. Among others in the fleet are: Alcedo and Akbar, owned by George W. Childs Drexel; Arawan II, owned by Commodore Longstreth; Trinitaria, owned by Louis S. Clark; Zipalong, owned by ex-Commodore E. Walter Clark; Caliph, owned by M. E. Brigham; Sea Wolf, owned by A. J. Drexel Paul; Sybilla III, owned by Fred Betz, 3d; Ponce, owned by Philip duPont; Alicia, owned by Alfred I. duPont; Chipper, owned by Cortland Wetherill; Nedeva II, owned by J. H. R. Cromwell; Little Aie, owned by E. I. duPont, and Georgianna III, owned by W. Griscom Coxe.

Many inquiries have been received at THE RUDDER office about books that could be studied which will give instruction about the work on a patrol vessel and the duties the men have to perform. Captain Charles Longstreth Poor has suggested several very good books which are mentioned in the book advertisement in another part of this issue. They can be procured through THE RUDDER.

Rudder 42-Foot Harbor Patrol Boat

WITH so many miles of coast-line, and particularly the North Atlantic, which has innumerable indentations and bays, it seems there should be some sort of small defensive and patrol fleet to prevent the possible location of a base for submarines. In addition there are many other uses to which small boats can be used, such as tending mine fields, harbor patrol, cooperation with air-craft, cooperation with land forces in defense of a district, etc.

While the average small power boats have been developed to a high degree, they are still distinctly yachts and except in rare cases will be absolutely unsuited for actual war duty.

In the design shown herewith we believe it to be the first that is designed primarily for such service and that can be afterwards converted into a yacht. A fleet of such boats can also be used as harbor police boats, oyster bed patrols, etc., in time of peace.

The Navy requirements for Class A slow are: length not less than 40 feet: sufficiently seaworthy to maintain station in harbor in all weather up to a moderate gale: speed not less than 7 knots: to be self-sustaining for four men for four days and to be equipped with a one-pounder and one machine gun.

In selecting a design to meet these, certain points were taken from small commercial boats, such as the fisherman which go and come in most all kinds of weather. The principal ones are breadth and depth.

We cannot recall a single instance of a small working or fishing power boat being as narrow as the average power boat used for pleasure purposes, and as steadiness is essential in gun fire, a breadth of 14 feet was decided on. This great breadth, with the ordinary type of form, would make the boat roll and toss in any kind of seaway as bad if not worse than a narrow boat, so that a hollow section with considerable deadrise is used and the bilge kept high so the motion will be easy and not violent as many may think.

It is a section that is found on seagoing fishing boats the world over and the advantages are so numerous that they cannot all be stated here but we will try to point out a few of the principal ones.

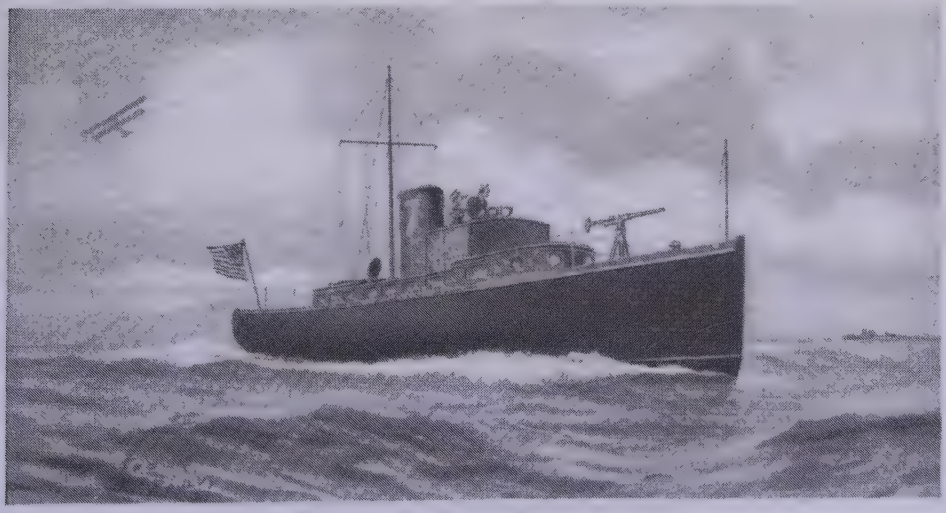
In the first place, every seagoing boat has to have a certain amount of depth and displacement so that they are not on top of the water and at the mercy of the broken surface. It is the depth under water that to a large extent counteracts the surface wave motion.

This section gives some depth to the boat and follows out this fact. By making it hollow, an even greater depth is attained, getting all the weights along the center line lower, particularly the engine, without increasing the displacement to too great an extent.

With any considerable amount of deadrise, the bilges are naturally high, making the motion easy and yet with the breadth preventing it from rolling over to as great an angle as a narrower boat would do.

The freeboard is fairly low for a boat of this length, headroom being obtained by the use of trunk cabins. The forefoot is fairly deep and the keel has considerable drag and while it would not maneuver as quickly as some boats, in any kind of a seaway it would be much easier on the helmsman, a fact that should be taken into consideration.

The propeller is low and well under the hull so



Copyright The Rudder Pub. Co.

Trident Model, Harbor Patrol Boat Suggested by The Rudder to Meet the U. S. Navy Requirements for Class A Slow

that it would not come out and race under the conditions for which the boat is intended.

The question of the rudder is a much debated one and we have shown it under the hull where it is protected, even when backing against a dock, although if desired an outboard rudder can be hung very readily.

In any alongshore and harbor work there is always a possibility of grounding, so a heavy shoe is fitted to protect the propeller and carry the heel of the rudder.

The arrangement of the accommodations and on deck are of course subject to such changes as will make them better suited to the requirements.

Briefly, as shown they are, on deck, a 14-foot forward deck on which the one-pounder gun is mounted, a 6.6-foot deck aft, the full width of the stern, 10 feet, on which may be mounted one or two machine guns, and the deck alongside of the house is, most of the length, 3 feet wide—wide enough to work on and also to mount a machine gun on either side.

The house is 8 feet wide, the forward and after ends being slightly raised above the middle portion, which is over the engine room and on the forward end of this sunken part, is the bridge deck. There are four hatches to below—one at the after end leading to the officers' quarters, one forward to crew's quarters, and one on either side of the after end of the engine room (not shown).

The stack is entirely for ventilation, the exhaust being run through the stern, and is the only practical means of ventilation in bad weather.

In signaling the numbers of flags used are as follows: Four for ships' numbers, three for general signal, two for urgent signals, and one for special ones. These flags have 2 feet hoist and there would be at least 18 inches between them so that, with the four set, from top to bottom would be 14 feet, so that the mast was made 21 feet above the deck to allow for this and still keep the lowest flag high enough off the deck so that it could be seen. Another feature is that they are on a stay forward of the mast and will fly clear without fouling and are led to the bridge.

The Navy regulations require that the national ensign be flown from the peak, so a small gaff is carried to meet this requirement.

There is a hinged chart table fastened to the bridge rail and for additional protection the weather cloth is carried around, on posts, for three sides of the bridge.

The searchlight is mounted on a platform on the mast so as to have the strong electrical current used for it as far as possible from the compass. The sidelights are mounted on the shrouds and well aft of the helmsman so that the glare they make in a fog will not interfere with his seeing ahead.

The steering apparatus is geared down so that it takes from eight to ten turns of the wheel to move the rudder from hard over port to hard over to starboard—for ease on the helmsman. A plate in the deck, over the rudder head, will allow for an emergency tiller being used should the regular steering gear be put out of commission.

Below there is an unusual amount of room due to the great breadth. Starting from forward there are two bulkheads carried up to 15 inches above the water-line, forming two open bins for anchors, cables, etc.

Then comes sleeping accommodations for four men, two regular berths and two transom berths in front of them. These are under the forward deck and the floor is lowered, giving 5 feet headroom.

Then comes the galley and messroom arranged as shown with over 6 feet headroom. This is handy to the bridge and hot coffee and soup may be passed to the helmsman with the least difficulty.

There is 6 feet headroom in the engine room and it is 8 feet 4 inches long, and the full width of the boat. On the starboard side forward is the crew's toilet and on either side winged out under the deck are the main gasolene tanks of 140-gallons capacity each. There is a work-bench against the after bulkhead and the lighting outfit is forward on the port side. The switchboards are on the forward bulkhead. The officers' quarters are aft and in the space are three full berths, a buffet and locker, a clothes closet, two seats, and the toilet.

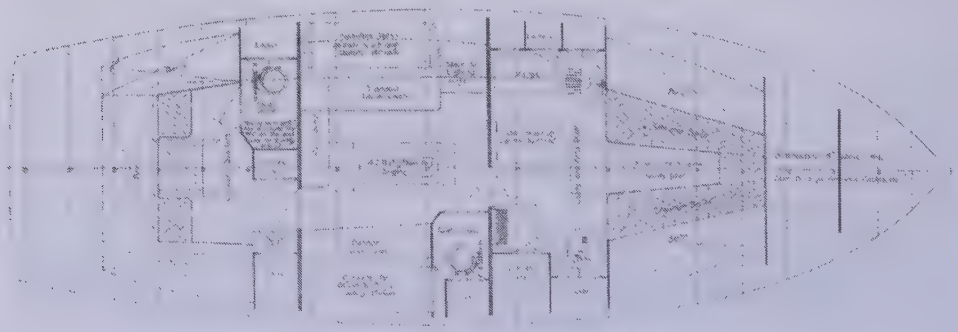
Under the after deck additional gasolene tanks may be installed to increase the cruising radius.

The only two criticisms we have had are that the gun is too far forward and the gunner too unprotected in this position and that the head stay will interfere with firing the gun over the bow.

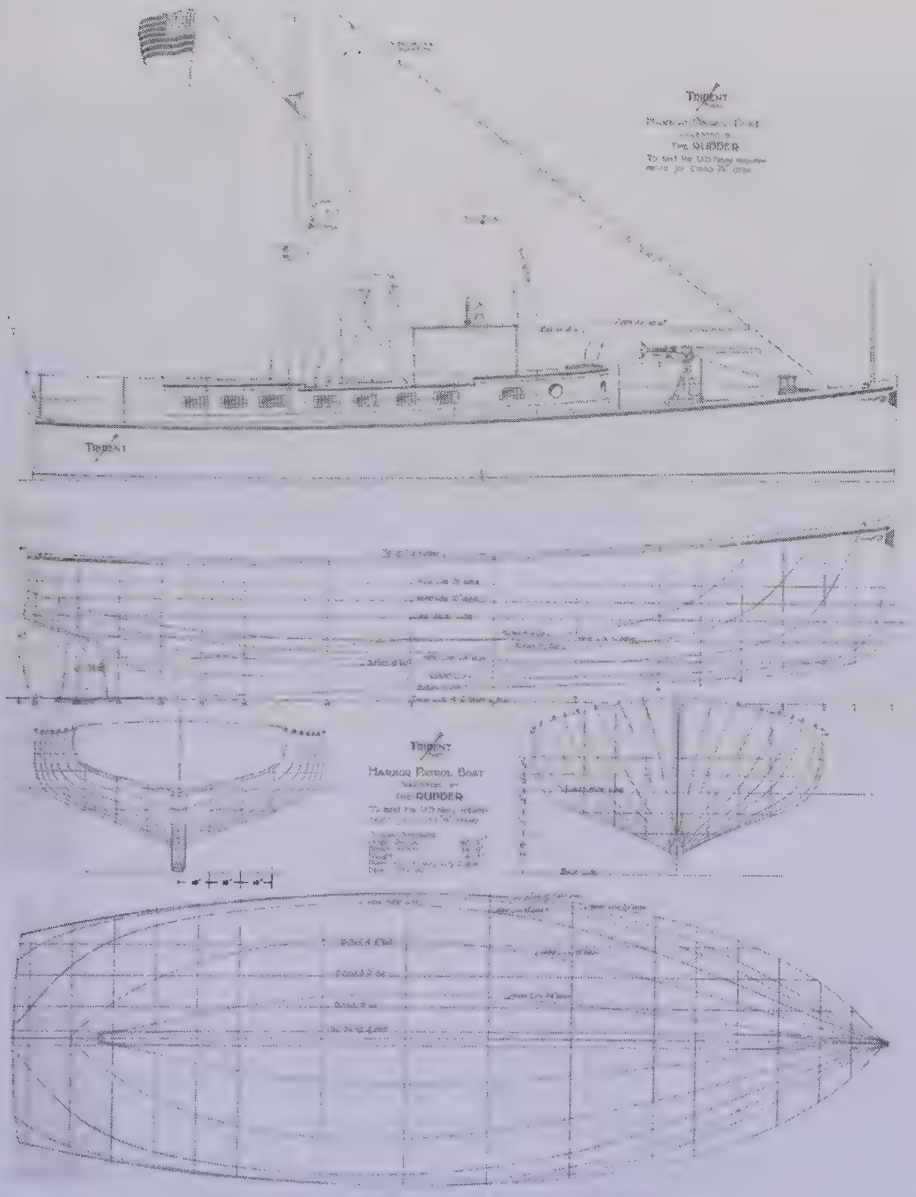
To correct the first the simplest way would be to move the house forward, carry the main deck across aft of it and mount the gun here—carrying the house sides aft to form a cockpit.

The second objection can be overcome by making the staysail smaller and bringing the stay aft of the gun.

Making the above changes would necessitate a rearrangement below deck but this can be worked out satisfactorily.



Arrangement Plan of Rudder 42-Foot Harbor Patrol Boat



Lines and Outboard Profile of 42-Foot Harbor Patrol Boat, Designed by Fred W. Goeller, Jr.

A Trip to the Georges

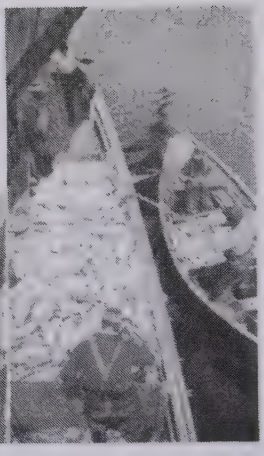
By F. W. Breed



19,000 Haddock on Deck



Cook Hoisting Out Last Dory



Pitching the Fish on Board

ON a beautiful Summer morning when a light Easterly breeze was stealing over the water, the schooner Josie and Phœbe, one of the cracks of Boston's fishing fleet, cast off her towline and headed down harbor. The breeze was strong enough to give her good headway, and she was bound on a "haddocking" trip to Georges, or as the fishermen term it, "down in the channel," a deep gully extending from off Sankaty Head inside Georges and the Cultivator Shoal, towards the Bay of Fundy.

The Josie, a modern, fast, able vessel of about 100 tons, with a crew of twenty-three men, was off Highland Light, now known as Cape Cod, slipping through the water at a speed which, if kept up, would put her on the fishing grounds in time to fish on the low tide in the morning.

Early in the next day the log had been hauled in, and all hands were called to bait up the trawls. These are long lines having hooks every 40 inches, which are bent on the ground line with a "gangen," a line about 20 inches long. The whole line is then coiled in tubs which are shown in the illustrations.

While the men were busy preparing for their work, Captain Larrie Norris, the skipper, had been jogging along with the schooner, occasionally sounding and trying to find the best spot to start work, and gauging the strength of the tidal current. To judge the current properly is very important, because should the current change and begin to run strong before the trawls are hauled in they are apt to part and much valuable tackle may be lost, and sometimes should a fog shut in some of the men in the dories may be lost, too.

After a hearty meal, of which there are four or five served daily, with much "mugging up" between times, the dories are hoisted out and dropped one by one in a long line, far enough apart so the lines will not foul each other and, after anchoring one end of the trawl, the men row away in parallel lines, heaving out until the trawl is all over. Now comes the schooner and gives the signal to haul. Everyone goes to it with a will and in an hour or more the boats come back to the vessel. The men waiting on the end of the line, fork the fish out on to the deck. Then, after eating again, the fish are dressed, washed and packed in plenty of shaved ice in the pens below. Our first set netted us nearly 9,000 lb, mostly haddock, with a few cod. All hands then set to work to overhaul the gear, straighten out snarls, renew hooks, gangens, etc., and if a man is smart he may now have an hour or two to rest before baiting for the night set.

We made another set that night on a falling glass, and secured another good haul, but by the time the last dories got back it was blowing a moderate gale, with the glass going lower and lower. At last, although an offshore fisherman hardly ever takes the mainsail off his vessel in the Summertime, we were forced to, as it would seem to an ordinary yachtsman as if the whole mast and rigging would be shaken out of her. Wild confusion reigned for a few minutes as the huge sail which swings on a 76-foot boom, came down on the run, with twenty-two men struggling with the slatting canvas, one blow of which would knock a man overboard, with no chance of being rescued.

The mainsail being tied up snug, everything movable on deck was stowed below, the jib furled and hoisted up on the stay, the jumbo (forestaysail) furled, we were hove-to under the foresail, which is the usual riding sail, and is made of extra heavy canvas.

It was then blowing with hurricane force, and we soon found from the height of the seas, which became mountainous, and the sounding lead, that we were getting dangerously near the shoals. As ill-luck would have it, the storm trysail was ashore, being put in shape for the Winter storms, and we were under the immediate necessity of tacking ship.

It is in such a tight place as this that the skippers of fishermen show their ability. The wheel was put hard up, and when she was nearly ready to jibe the foresail came down on the run and the twenty-two huskies jumped on it and tied it up, but not before the 6-inch bolt rope on the leech had been ripped off, much as one would tear the hemstitched edge from an old handkerchief, and one man

hurt so badly he was unable to work again for nearly a month. Next the forestaysail quickly was run up, the wheel put hard down, and we were hove-to after a fashion on the other tack, and rode out the blow.

After it moderated we made sail and had several days of good fishing, with good luck, and after making our next to last set before starting for home, the glass began to jump, and the skipper figured we could make a set on the high water by hustling. Trawls were hastily baited, while the fish from the last set were lying on deck. Everything was in confusion. The dories went out with every prospect of a rough, nasty night, with a Westerly gale in the making, and liable to break before daylight. Fortunately, we picked up every man safely after daylight, with the loss of only a small amount of gear, and had a good haul of fish. Several of the men said it was the worst night they had ever had in a small boat.

By the time the last of the men got aboard it was blowing a gale from the Northwest. We were in sight of three other vessels who were dressing down their fish, preparatory to "swinging her off for the market."

We had a double catch of fish to dress and all hands were hustling as hard as possible. They often glanced towards the other vessels which were ready to start for home, and each man realized that if they got there first a large percentage of his profits would be lost. Each man realized, too, that a race was coming, the like of which can only be had on the fishing grounds when the skipper has nerve and ability and the support of every man in his crew.

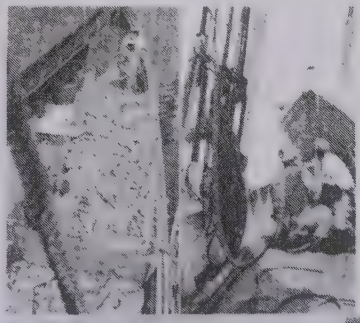
The man at the wheel was giving the Josie a gentle full to keep her moving. He was itching to haul on the wind with sheets trimmed, knowing that in a fair race the Josie would easily outsail the others. He just hated to see the others sailing away. Then a huge sea boarded the schooner, swept a ton or more of fish over the side and almost carried off two of the men. The skipper then cautioned his helmsman, giving him orders to keep her hove-to until all was snugged down for the long beat to Boston. The skipper knew his vessel and he knew that under the conditions he would win. At last all the fish were stowed, and with sheets trimmed flat, the Josie started her long chase. She jumped in the short "channel" sea until it seemed as if she were all under water. Every plank and timber was straining under the press of canvas which was driving her into the steep head sea. The skipper stood hunched up on the weather side of the house, never moving except to dodge an occasional sea which came back over the top of the house, and shouting "Keep her off!" when the man at the wheel seemed concerned at the depth of the water around the wheel-box.

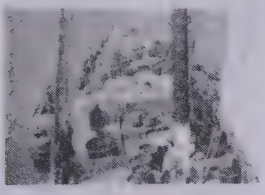
It was a glorious race. The Josie at times fairly staggered under the force of the wind. She had her lee rail under the water all the time, and at times green water on deck almost up to her mast, but her skipper never faltered, and kept driving on until land was made. In the evening she was off Chatham, and had passed her three rivals. One of these, a Provincetown "Portugee," in shortening sail had three men swept off the bowsprit. Two were got aboard, but one was lost.

The wind, by this time, had moderated so that topsails could be carried. Two of the other fishermen were still in sight, but far astern, and when the Josie's topsails were set, they set theirs. During the night the wind increased again, but the Josie held on to her canvas, and when she picked up her tow just inside the harbor, she was four hours ahead of the first of her rivals, which had got away from the fishing grounds well in the lead. No other fisherman was in sight when the Josie sold her catch at the dock, and this meant an extra $20 to each man in the crew, as the fish brought a good price.

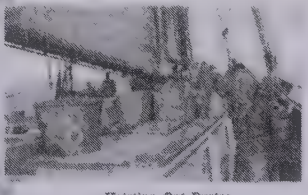
This is the great incentive for the wild races often sailed by the skippers of the fishing schooners, some of whom have absolutely no mercy on the vessels and very little thought for their men.

Boston, Gloucester and Provincetown are the chief ports to the East of Cape Cod from which the fishermen ply. Winter and Summer, fair weather and foul, these staunch craft put to sea, visiting the different fishing





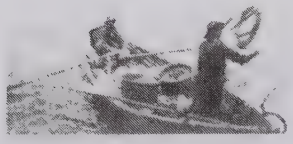
Dory Returning



Hoisting Out Dories



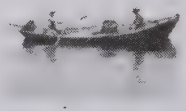
Top, Left: Part of a Catch. Right: Lowering a Dory
Center: Captain Larrie Norris
Bottom, Left: Baiting Trawls. Right: Washing Fish



After the Catch



Josie and Phoebe



Hauling Trawls

grounds and then hurry to their home port, all hands eager to land the fish in market as soon as possible. There is no storm that does not catch some vessels offshore, and that more are not lost is the marvel. Each year several are lost and many of the men, too, lose their lives either from being washed overboard while racing home, as did the Josie and Phoebe, or drifting away from the fishermen while in their dories, lost in the fog.

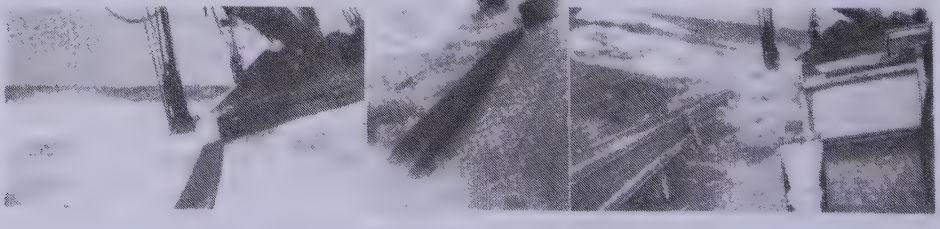
There is a fascination about the trade though, and no matter how many disasters occur each season, there are always men anxious and willing to become fishermen and to take their chances of making money, winning fame as a daring skipper or being lost in the deep.

The vessels have always had an attraction for yachtsmen, and some have had pleasure craft built on fishermen's lines. The latest of these is the Finback, an auxiliary ketch built last Winter for C. H. W. Foster, a well-known Marblehead yachtsman. This vessel recently took part in the cruise of the Eastern Y. C., and attracted much attention, not only for its general appearance, but for its accommodations and for its seaworthiness. The late L. J. Callanan had a schooner, the Eclipse, built on fisherman's lines, which while not a noted racer, was a good, staunch, comfortable cruiser. The Eclipse drifted into trade, and was last heard of when some interned German sailors escaped from Norfolk and put to sea.

The picturesque attraction of the fishermen is, however, gradually disappearing. In years to come those engaged in the trade will wonder how their predecessors did so well under the conditions that prevailed. It may be, too, that the art of sailing will have disappeared and the gasolene engine is responsible for the changes. There are auxiliary fishermen nowadays. They use power when the wind is light and use power, too, in their dories, instead of making the men row away from the mother vessel, and after a day of hard work at the trawls, row back again. The gas engine is quietly revolutionizing everything connected with the sea. On the other side of the Atlantic the steam trawler and trawlers equipped with oil engines have driven the smack almost off the seas, and these trawlers used by the belligerent powers have done wonderful work as mine sweepers, as scouts and on patrol work. Kipling has told of what the British trawler has done, and after the war the German trawler and those of other nations will be lauded in similar manner. In case of hostilities in which this country may be involved, the fisherman will do his share of work and do it well. They know the sea in all its whims. They know the coast and all its harbors and they will be of inestimable value in the defense of the country.

Only recently the crew of the Josie and Phoebe rescued the crew of a Canadian fisherman which was unable to successfully battle with the wind and seas. Every man of the Canadian was rescued and in appreciation of this work Captain Larrie Norris received a gold watch from the Canadian Government which was properly engraved, and each man of the crew was the recipient of a gift, too.

The Yankee fisherman has taken advantage of present conditions and has carried his trade into the waters of the warring nations. Some have been held up by the British because it was feared that they were trying to carry fish to Germany, but in all cases this has been found to be incorrect and the hardy sailors were simply trying to fish in foreign waters where the local fishermen are not doing as much as in peace times. These fishermen wander far from home waters and will go anywhere in any weather if they think they will make good catches, and for these reasons have crossed the Atlantic seeking the elusive herring and have in many instances brought their cargoes safely back to some American port. They are a hardy lot of daring sailors but the toll paid each season for their daring is a severe one, and each year Gloucester pays tribute to those who have been lost by holding religious services in all the churches for those who have been lost at sea. In the event of war, some of these crews will be recruited to assist in patrol work, the conditions of which they are thoroughly fitted for.



Pictures Taken During the Boat Back to Boston in Northwest Gale

The Log Boats of the Chesapeake Bay

By Stuart Stevens Scott

OF all types of craft, sailing, auxiliary or power, there is none that is as interesting as the Chesapeake Bay bugeye, a vessel that is distinctly a product of that great inland sea that divides the States of Maryland and Virginia. On other waters the bugeye is a rare sight and the few that now and then do get elsewhere always excite much curiosity.

All boats bear more or less of a resemblance but the Chesapeake Bay bugeye is distinctive. It is a class to itself. While there are modifications, even on the Chesapeake, the true type is a development of the dugout log boat made by Indians long before John Smith and his gallant band pitched their tents at Jamestown, whence they cruised Northward on their explorations.

To the early settlers the log canoe was as much a curiosity as was the plank and frame boats to the redskins. Here and there in the Colonial history of Virginia reference is made to the dugout, and while the craft of the Indians were logs gouged out with shells, it did not take the settlers long to see the advantages of the solid hull. Of course the settlers, with their sharp-edged tools and superior knowledge, made more shapely craft than those of the aborigines.

It was simple to build a boat in those days. Huge pine trees measuring 36 inches through were common. Today it is doubtful whether a pine tree measuring half that diameter can be found in all the Chesapeake region. From the period of the dugout to the second development, the built-up canoe, there is no definite history. It is pretty well established, however, that for upwards of two hundred years canoes of the built-up type have been built and at some time within this period the bugeye was developed.

The bugeye of the true type is a log craft, built up in sections, as is the canoe, and the only difference is that the bugeye is larger, is decked over and carries her sails on permanent masts. In construction methods there has been but little change. Iron has taken the place of treenails, but even in craft built within the past decade black iron has been used in preference to galvanized iron or bronze because, it is claimed, the rusting of the iron gives a better grip in the wood.

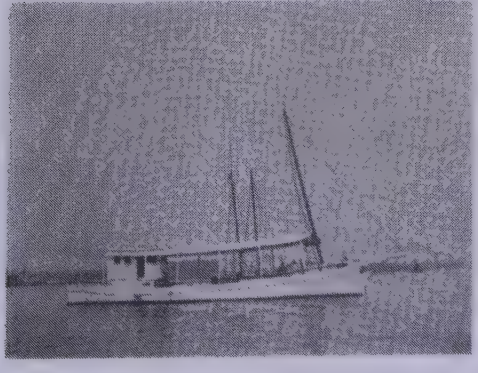
Of late years, owing to the scarcity of logs of suitable lengths and diameters, numbers of frame and plank bugeyes have been built, but now and then one sees a new log craft which indicates that the type will not be extinct for some time to come.

For more than two hundred years the log canoe has played a most important part in the lives of thousands of men on the Chesapeake. There is no body of water on which more men gain a livelihood. Fish, crabs and oysters in hundreds of thousands of tons, barrels and bushels, are taken annually. From the time the ice goes in the Spring until it closes the rivers and creeks in the Winter thousands of craft of every type, employing tens of thousands of men, are engaged in reaping the harvest on this huge wet farm.

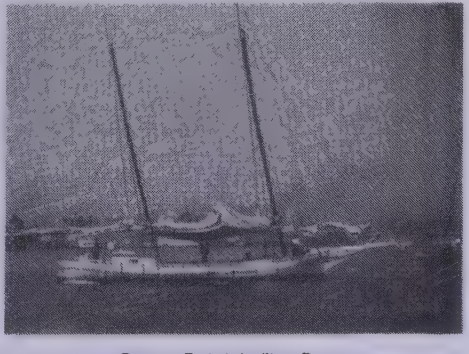
Prior to the gasolene engine, which hasn't been so many years, the workers on the Chesapeake depended on sail power. In the oyster dredging now only craft propelled by sail may be used, according to the law. This law was enacted by the Legislature of Maryland in the early days of steam navigation, because it was commonly believed that companies would be formed and steamers would be used to drag every oyster from the bay. It was a law to protect the poor tidewater man who couldn't afford to buy and operate a steamer.

While frame and plank craft were not unknown in tidewater Maryland and Virginia, it was proven beyond all question that the log canoe was faster under sail. These canoes were developed to a high state of perfection. They were not expensive, a 25-footer costing about $100, complete, and as a boat is as necessary in the tidewater counties as is a horse and buggy elsewhere, every man who fished, crabbed or oystered, owned one.

Between seasons there were races and this brought



Bugeye William J. Blackford, Converted Into a Power Barge



Emma, a Typical Auxiliary Bugeye

about the development of racing craft. Not that the racers were any different in construction from the work-boats, because all were work-boats first and racers afterwards. Getting out to the grounds in the early morning and getting back at sundown was just that much lost time, and every man wanted a boat that would get him to his destination in the shortest possible time, so that one of the requisites of the canoe was speed.

The races that were held at St. Michaels, Oxford, Cambridge, Solomons Island and other towns, were annual events. They were widely advertised and on many occasions as many as fifty canoes would start. All boats were raced on the basis of over-all length. There was no limit to amount of sail or number of crew. Most of the boats carried masts so tall and heavy that when the spars were stepped six or eight men had to remain in the boat to keep it right-side up. Down the wind huge squaresails were hoisted and it required the keenest kind of sailing to prevent a capsize. Once over, the masts would be pulled out, the hull righted and bailed out, the masts restepped and the race continued.

I once saw the Island Blossom race against the William V. Wilson. In a flaw the Blossom capsized and the Wilson gained a lead of a mile before the Blossom was again under sail. In spite of the handicap the Blossom won. Five thousand men, women and children saw that race. It was the Eastern Shore against the Western Shore and the Blossom carried the hopes of the former. A great many dollars changed ownership after that race was over.

The Island Blossom is the descendant of a long line of "Island" boats and she is the queen of the Chesapeake, having held that honor for ten years. In 1910 she raced against and defeated the Q Class boat Ojigwan. The Blossom, like her predecessors, was built by Greenbury Coffin, of Tilghmans Island. Coffin was a master hand and of the racing craft he turned out each was faster than the other and each was a champion.

His first boat was the Island Bird. Then followed the Island Beauty, Island Belle, Island Bride, Island Queen and Island Blossom. Although the Bird is more than fifty years old she is still in service, though as a power boat. Incidentally, every one of the other "Island" boats, except the Blossom, is a power boat.

That these log hulls were more speedy under sail was proven conclusively about fourteen years ago when a syndicate of Baltimoreans employed John Hudson, a splendid small-boat designer, to build a plank and frame boat to race against the Blossom. The new boat was named the William N. Neimeyer. She did not accomplish her purpose. The Neimeyer is now a power boat.

The day of the log canoe is gone. It is doubtful whether one was built this year. Not only are logs scarce but the gasolene engine has revolutionized the type of the Chesapeake Bay work-boat. Save in rare instances, the sailing canoe is not seen. Engines have taken the place of canvas even among the poorest of the tidewater darkeys.

Only recently I was in the salesroom of Unger & Mahon, on Pratt Street, Baltimore, and heard an Eastern Shore negro dickering for an engine.

"'Deed, Boss," said the darkey, "I'se just gotter have er engine. Ah cain't git erlong nowho widout one."

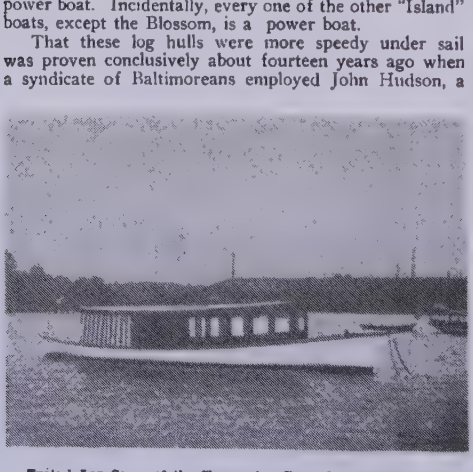
That's the general expression—"Can't get along without one"—that is heard throughout the tidewater counties of Maryland and Virginia.

But to get to the construction of the log craft, the feature that makes these boats distinctive to the Chesapeake region.

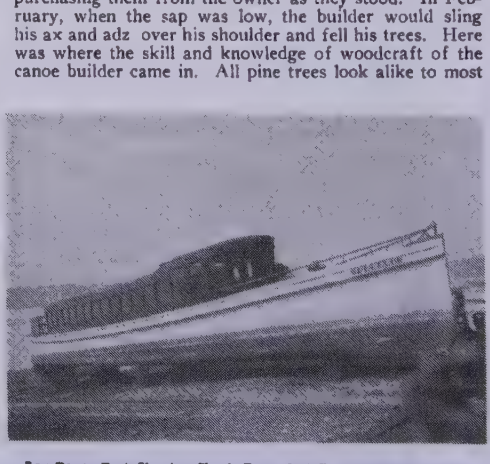
A log canoe or bugeye is not "laid down," as is a frame and plank boat. Nor is it planned in advance in regard to its lines, except in a general way. More than that log craft are seldom built in shipyards. Few canoe or bugeye builders have been so by trade. It has usually been a side line of a farmer or oysterman. Greenbury Coffin was about as near a professional boatbuilder as any man and yet it was after he had built his last "Island" canoe that he established a shipyard. Even then he only made repairs. Prior to that he was a farmer.

In the "good old days" when a man wanted a canoe he went to one of these men who knew how and gave the order. The length and width were the only specifications. The width was the factor that determined the future use of the boat. If speed was wanted then the breadth was 5 feet to 5½ feet to 25 to 30 feet length. If for carrying first and speed secondary then the breadth would be as much as 6 feet or even a little more.

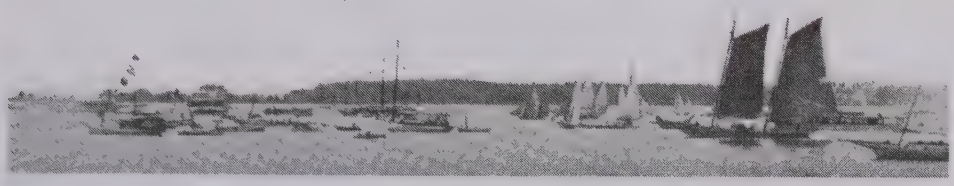
When the builder had leisure during the Winter he would go into the nearby woods and select his trees, purchasing them from the owner as they stood. In February, when the sap was low, the builder would sling his ax and adz over his shoulder and fell his trees. Here was where the skill and knowledge of woodcraft of the canoe builder came in. All pine trees look alike to most



Typical Log Canoe of the Chesapeake; Formerly a Sailing Craft



Log Power Boat Showing Chunk Tapered at Bow to Fit Center Piece



Start of a Canoe Race at Oxford, Md.

men but there is a difference, and it is essential to select a tree with a perfect grain, a tree that is healthy and straight. Such trees are scarce and I recall that when Coffin built his last canoe, a 45-footer, for N. Tip Slee, of Baltimore, about twelve years ago, he and Slee traveled about 100 miles before they found six pines that would answer their purpose.

When the first tree was felled the canoe builder did all of the rough work of shaping it into a "chunk" where it lay. Then he would go to the next tree and so on until he had the requisite number. The "chunks" would then be hauled to his place, where the actual construction of the boat would be carried on.

The "chunk" that would form the centerpiece, or keel, would be laid down on a fair surface and the slot for the centerboard cut out. This "chunk" would vary in size according to the size of the boat. For a 30-footer it would be about 6 by 8 inches. For a boat 75 or 80 feet long it would be about 20 by 20 inches.

An expert would have had his "chunks" pretty well faired up while the logs were in the woods and all that he would have to do at his "yard" would be to go over them with a plane and fair the edges so they would make a neat fit. Beginning on one side, the second "chunk" would be bolted to the centerpiece, the third to the second and the fourth to the third. The several "chunks" would be so shaped that the hull would be formed roughly.

Then began the adz work, the work that called for the real skill, and chip by chip the excess wood would be cut away until the inside was perfectly shaped. On small canoes it was easy to turn them upside down and work on the exterior but larger boats had to be worked up as they stood. To follow definite lines was next to impossible, yet every builder had certain ideas as to hull shapes and these were followed.

The whole work was not unlike whittling a model out of a solid block, except that an adz instead of a jack-knife was used.

The owner of a log canoe possessed a great advantage over the owner of a plank and frame boat, for he could always make changes in the lines of his boat without expense. All he needed was an adz and a plane and he could chip off here and there until he had just the model he sought. If, upon trying out, he found that he had not secured the speed he wanted then all he had to do was to haul out, turn the hull upside down and go to work again. With a body from six to twelve inches in thickness he had a wide range of area for his cutting without materially affecting the hull.

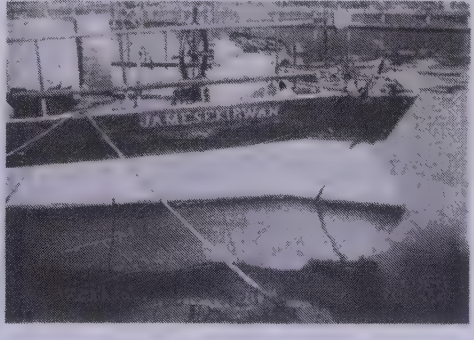
Every veteran yachtsman of the Chesapeake will recall Tip Slee and his famous canoe, Rambler. This was a 45-foot craft that was built for the championship. With a crew of thirty men and twenty outriggers, the Rambler gave one the impression of a picket fence on an outing when she was underway.

Each Winter for three successive years Tip had the Rambler upside down at the Corinthian Y. C. and put in all of his spare time cutting slices from her bottom, trying to "fine her out" until the matter became one of the standing jokes.

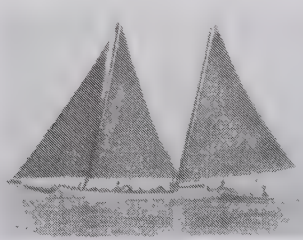
But Tip had so much difficulty in getting the immense crew that was necessary that he abandoned his attempt to get the championship and the Rambler was never raced. She was finally cabined over, given a rig of a



You Can't Hurt a Log Canoe



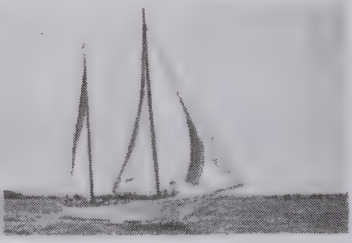
Stern and Steering Gear of a Bugeye



Using the Power Yawl When the Wind Gets Light



Mollie F. Leonard, Largest and Fastest Bugeye on the Chesapeake



The Clipper Bow is One of the Characteristics of the Bugeye

sloop with a batwing mainsail, and an engine installed. She is still afloat.

The building of a log boat was always of interest to the people in the community. Not only the men were curious but even the young women, for in the early days in the Chesapeake region the women were taught to sail, even as today they are taught how to operate power boats. But the men would naturally take the keener interest in the new boat and when there was nothing else for them to do they would gather around and help with their advice; sometimes with their muscle. It is easy to imagine such a gathering—to see the old men stand off and squint along the hull or walk along the boat rubbing their hands over it and commenting on "the lines."

After the interior of the boat was shaped the "processing" was begun. This was merely pouring in linseed oil and turpentine until the wood was saturated. This was always done to log boats, the object being to preserve the wood and to prevent it soaking up water. Even now owners of log boats haul out for a week or ten days during the Summer and pour oil and turpentine into them. This treatment does preserve them, too, as there are many canoes and bugeyes that are in thoroughly good condition after service varying from seventy-five to a hundred years.

Owing to the great weight of the log hulls of the bugeyes of any size it was customary to launch them before any of the upper works were built. Usually the launching facilities were as primitive as the boats. Frequently the boats were built a mile or more from the water.

Launching day was an event in which the neighbors for miles around participated. "Lem's bugeye is going over next Tuesday and you're asked," was about the extent of the formality of invitation and it was passed by word of mouth throughout the neighborhood. On the day set, early in the morning, the neighbors would arrive. The menfolk would be clad in their working clothes but the women would be in holiday attire. All hands would bring their own luncheons because, unlike the corn-huskings and other gatherings, there would not be a post-launching dinner.

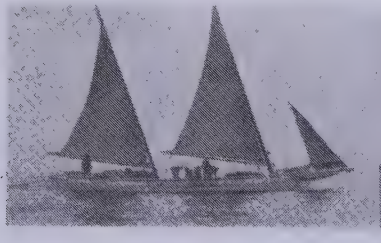
Getting the hull into the water naturally depended upon whether the boat was close or far away, but into the water it would go even if it had to be dragged a mile on skids and all the horses in the neighborhood had to be put into harness and hitched to it.

As only the bottom and bilgepieces were of logs, the remainder was built up of plank. To the hull, inside, frames to carry the planking and deck were bolted and from that point on the procedure was as with a frame and plank vessel.

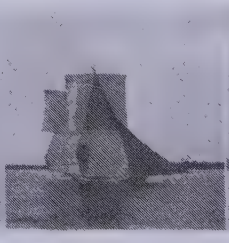
Where the name "bugeye" came from no one knows; at least, I have never met one who could tell me. It has been stated that the original name was "buckeye" and that was because the hawsepipes looked like the eyes of a buck, but that some wit remarked that they looked like bug eyes to him, hence the name by which they are now known.

The rig of the sailing bugeye is as distinctive as the hull, consisting of two sharply raking masts carrying two leg-o'-mutton sails and a jib. Usually the jib has a bonnet, a section that is taken out to shorten the sail instead of reefing. The sharp raking masts are identical in principle with short masts and a high-peaked gaff, only the leg-o'-mutton sail is much easier to handle. The boats being of shallow draught, centerboarders, the center of effort of the sails is low, hence their ability to carry sail a long time.

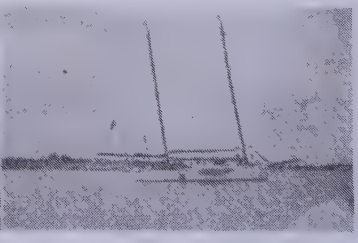
In spite of their weight log bugeyes are speedy. They are fast to windward and in reaching and when just ballasted with a cargo they will give any sailing craft a good



Dredging for Oysters



The Island Blossom Under Full Sail



Javelin, Equipped With a 25-H.P. Standard

race. And there are some large log bugeyes, too. There are a number of them 80 feet to 90 feet on deck and having a capacity for 1,200 bushels of oysters. The Chesapeake Bay sailor seldom speaks of a vessel by its length but by its oyster capacity, whether it be 20 bushels or 1,000 bushels.

As an auxiliary a bugeye is at its best, but its shape is not well adapted to all power. Not that it is not a splendid vessel, so solid that every bit of vibration is absorbed, but there is a great deal of waste space in the finely drawn out ends and the schooner model is more preferred. In spite of this there are a number of bugeyes that are operated entirely by power, and there would be a great many more were it not that they are extensively used in the oyster business. Besides there is a law that requires a licensed engineer, a luxury that few bugeye owners can afford.

But this does not mean that bugeye owners do not have power. Nine of every ten have power skiffs and these small craft give a helping hand when the wind is light. Even when oystering the skiffs are used to get the bugeyes to or from harbor and this is permissible; at least, no one objects.

There are, besides the sails, a number of features about the bugeye that makes it distinctive. Take the rudder; hung outboard and controlled by iron rods that reach to the steering gear on deck. Of course there are modifications. Some bugeyes have round sterns, others have their decks built out aft to give more space. The bow, too, is distinctive with its cutwater and "trail boards."

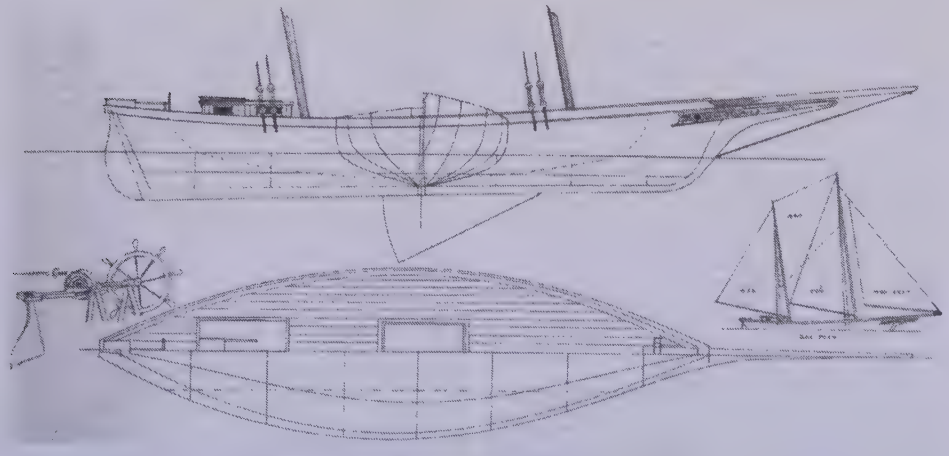
The Chesapeake Bay bugeye has been copied by many yachtsmen but, as a rule, the copies have been frame and plank boats and, after all, are modifications. The attempt to get a snappy, yachty craft out of a type built entirely for work usually ends up in a half-breed kind of a boat that is neither one thing nor the other.

Perhaps the only real bugeye yacht on the Chesapeake is the Javelin, owned by W. W. Grier, of the Capital Y. C., of Washington. She is a 50-footer and is an auxiliary, having a 25-h.p. engine. On the other hand there are scores of "converts"—bugeyes that have been given deckhouses and are used for pleasure purposes. With engines of moderate power they make fair speed in smooth water while the sails come in when there is a breeze.

The hard usage that these log boats will stand makes them favorites. They are practically indestructible and they will go through what would absolutely ruin a frame and plank boat. They are the poor man's craft, hence their popularity. Scores of these log boats are used solely for pleasure and numbers of them are enrolled in the power-boat clubs at Baltimore. While they have a tendency to settle when running under power this, in many of them, is overcome by building a small platform just over the propeller. For their size these boats have a wonderful carrying capacity.

There is one boat in Baltimore, the Forward, that is built of logs on a launch model. Her owner believed that the heavy hull would absorb vibration, and it did. The Forward is a 45-footer and she makes fairly good speed with her 25-h.p. engine and is as steady as a church.

If you ever cruise on the Chesapeake, and you are interested in these log boats, make a stop at Baltimore. In Canton Hollow or at Long Dock you will find many of these bugeyes, while at Ferry Bar you will see the log canoes, and you may study them at your leisure.



Plans of a Typical Chesapeake Bay Bugeye, by Wm. C. Leiber

Delaware River and Southern New Jersey

By J. Kinzer Shell, Jr.

CRUISER racing will be the chief attraction on the Delaware River, Barnegat Bay and the South Jersey Coast this coming Summer, according to the schedules which have been arranged by the four organizations in the three sections. Taking the races as a whole without divisions, there will be nineteen recognized contests, all told. Added to this number, the divisions of classes, there will be thirty-five events for cruisers rating from 29 to 45 and over. The events will be in distance from 15 nautical miles up to 154 nautical miles. There will be nine sanctioned races for championship honors. Eight of these will be divided into classes, thus making seventeen sanctioned and championship events.

The greatest amount of cruiser racing will be done on the Delaware River, where the Delaware River Y. R. A. and the Delaware River Yachtsmen's League hold forth. While the Delaware River Yachtsmen's League will hold a series of four races, with three divisions, from 30 to 45 and over, the League is an outlaw in the A. P. B. A., and as they will hold their races under the 1916 rules and regulations of the parent body, cannot obtain sanctions for their contests. The Delaware River Y. R. A. will hold three cruiser races during the Vacation Cruise to Chesapeake Bay; a race for the Delaware River Championship and two other events.

The granting of sanctions to the clubs holding race-meets of the South Jersey Y. R. A. will make the cruiser races interesting. Five events will be held, with two classes in each, ranging from under 45 and over 45 in rating. Added to this will be the third annual championship contest for the Coxe-Hall Trophy, in which the cruisers of the three sections will compete. The Barnegat Bay Y. R. A. will hold two cruiser races, one for the championship of Barnegat Bay, while the other will be for the New Jersey State title. There will be two divisions in each class, rating from over 45 and under 45.

The season will open on June 8th and 9th with the 154-nautical-mile race of the Yachtsmen's Club to Overfalls Light Vessel and return. The start and finish will be off the Riverside Y. C., of Essington. The Yachtsmen's Club recently rejoined the Delaware River Y. R. A. and the A. P. B. A. The Overfalls race will be the first in which the new rules can be tried out. It is predicted that at least thirty boats from not only clubs on the Delaware River but from organizations on the Jersey Coast will be competitors for the title.

The schedules arranged are as follow:

June 8-9th.—Yachtsmen's Club race to Overfalls Light Vessel, on the Delaware River, starting and finishing at the Riverside Y. C.; distance, 154 nautical miles.

July 2d.—Trenton Y. C. to Riverside Y. C. race under auspices of League, three divisions; distance, 38 nautical miles.

July 7th.—First race of the South Jersey Association over course of Atlantic City Y. C., two divisions; distances, from 15 to 50 nautical miles.

July 14th.—Camden Y. C. to Farragut Sportsmen's Association race of the League, three divisions; distances, 15 to 25 nautical miles.

July 21st.—Ocean City Y. C second race of the South Jersey Association, two divisions; distances, from 15 to 50 nautical miles

August 3d.—Camden M. B. C. to Corinthian Y. C. of Cape May, sanction race of the Delaware River Association, for championship title of Delaware River, two divisions; distance, 91 nautical miles.

August 4th.—Coxe-Hall Trophy race, starting and finishing at the Corinthian Y. C. of Cape May, one division; distance, 51½ nautical miles. Third race of the South Jersey Association, over Corinthian Y. C. course, two divisions; distances, 15 to 50 nautical miles.

August 11th.—Barnegat Bay Association championship race, start and finish at the Seaside Park Y. C., two divisions; distance, 50 nautical miles.

August 18th.—Chance race of the League, starting from Columbia Y. C. and finishing at Trenton Y. C., distance, 25 nautical miles.

August 18th.—Fourth race of the South Jersey Association over the course of the Avalon Y. & M. C., two divisions; distances, 15 to 50 nautical miles.

August 20th.—First race of the Week of Cruise of the Delaware River Association, from Betterton, Md., to Annapolis, one class; distance, 34 nautical miles.

August 22d.—Second race of the cruise of Delaware River Association, from Annapolis to Solomons Island, one class; distance, 43 nautical miles.

August 25th.—Third race of the cruise of the Delaware River Association, from Solomons Island to Baltimore, one class; distance, 52 nautical miles.

August 25th.—Championship race for the New Jersey State title, starting and finishing at the Island Heights Y. C., two divisions; distance, 50 nautical miles.

September 1st.—Fifth and final race of the South Jersey Association, starting and finishing at the Stone Harbor Y. C., two divisions; distances, 15 to 50 nautical miles.

September 8th.—Final race of the Delaware River League, start at Columbia Y. C., finishing at Wissinoming Y. C., three divisions; distance, over 15 nautical miles.

September 8th.—Ship John Trophy contest, starting and finishing from the Salem Rod, Gun and Y. C. to Cross Ledge and return; distance, 53 nautical miles.

September 15th.—duPont Trophy contest, starting and finishing at the Riverside Y. C., distance, 50 nautical miles.

South Jersey and Barnegat Bay

Power-boat racing and sailboat competition on the South Jersey Coast and Barnegat Bay this Summer, will be far more successful than in previous years. The arrangements are such that there will be sufficient racing of championship calibre for every class of boat to make it interesting. The South Jersey Y. R. A. officials will follow out the same idea as promulgated last season in holding their race-meets. Instead of each club affiliated with the Association holding a regatta, the schedule has been cut in half, and only five race-meets are arranged for. The race-meets will be on the sectional order, the two clubs in each section working in conjunction on a regatta.

Another interest which will mean a great deal to the racing game along the Jersey Coast will be the competition of the boats, designated by the racing commission of the South Jersey Association, for the James Gordon Bennett Trophy. While no announcement has been made by the racing commission of the Association relative to the class of boat which will compete for the trophy, it will probably be open boats rating from 45 and over, and these will start in a series of five races.

The participation of the South Jersey Y. R. A. fleet in the two race-meets of the Barnegat Bay Association will make competition keener. This season the Barnegat Bay Association will hold two race-meets, one for the title of Barnegat Bay and the other for the New Jersey State title.

While power-boating will be followed closely along the Jersey Coast this Summer there will be an added interest in sailboat competition. According to plans being formulated, the three sailboat clubs of the South Jersey Y. R. A. will hold a series of races for the one-design sailboats, while on Barnegat Bay there will be a series of races for both catboats and sneak-boxes of the one-design class. There will be the championship races for one-design boats for the Morgan and Sewell Cups, which have taken quite a hold on the sailors on Barnegat Bay. According to latest report the South Jersey Association will likely, through the Atlantic City Y. C., be represented in the one-design sailboat contest. It is reported that the Atlantic City Y. C. is going to make an effort to have several outboard sloops built for competition for the Schermerhorn Cup, which has been competed for annually by the sloops of the Ocean City Y. C. and the Island Heights Y. C.

The South Jersey season will open on Saturday, July 7th, when the first race-meet will be held under the joint auspices of the Chelsea and Atlantic City Clubs over the course of the latter club. Two weeks later, on Saturday, July 21st, the Ocean City Y. C. will hold the second annual race-meet. The club will conduct the meet alone, as the other club in the section, the Ocean City M. B. C., last season went out of existence.

On August 4th the Corinthian Y. C. of Cape May and the Cape May Y. C. will hold the third race-meet, the races being over the course of the first-named club, The feature of the third race-meet will be the third annual competition for the Coxe-Hall Trophy, which will be contested for by the boats of the Jersey Coast, Delaware River and Barnegat Bay. The race, which will be 5½ nautical miles in duration, will be for championship honors and it is expected that at least a score of cruisers will compete.

The annual championship regatta of Barnegat Bay will be held under the auspices of the Seaside Park Y. C. on Saturday, August 11th. There will be races for open boats, cruisers of the two classes, displacement racers and express cruisers, besides the competition for the Sewell Cup and a contest for one-design sneak-boxes and catboats. On Saturday, August 18th, the fourth race-meet of the South Jersey Association will be held under the joint auspices of the Sea Isle City Y. and M. C. and the Avalon Y. C. over the course of the latter club.

The championship races for the New Jersey State title will be held under the auspices of the Island Heights Y. C. on Saturday, August 25th. Practically every racing boat will be on hand and it is expected that the first annual affair last season will be far outclassed this Summer. The final race-meet of the South Jersey Association will be held on Saturday, September 1st, under the auspices of the Stone Harbor Y. C., with the Holly Beach Y. C. officers and members lending a helping hand. It is understood that the race-meets on Barnegat Bay and the South Jersey Coast will be for championship honors, being sanctioned by the A. P. B. A.

Delaware River Racing Schedule

Power-boat racing on the Delaware River from Trenton to Westville will take on a new lease of life this Summer according to the announcement of the racing schedules by the regatta committees of the Delaware River Y. R. A. and the Delaware River Yachtsmen's League. Several new arrangements for competition have been made by the two organizations. The races of the Association will be held under the new rules and regulations of the A. P. B. A., while the port-to-port race-meets of the League will be held under the 1916 rules.

The port-to-port race-meets of the League will be one of the features of competition on the Delaware River. The boats of the three classes will race from one designated club to the anchorage of a club up-river or down-river as the case may be. The Chance race will be one of the features of the League schedule, the boats being sent away as one, and the boat finishing first will get as many chances to draw for first prize as the number of boats which she defeats. As the race falls on the same day as the official starting of the second annual week of Vacation Cruise of the Association, arrangements have been made whereby the boats competing in the contest may have plenty of time to get to the rendezvous of the fleet at either Delaware City, at the entrance of the Delaware and Chesapeake Canal, or at Betterton, Md. The League has decided to hold their race-meets on the point system; the club having the largest number of boats competing, irrespective of class, will be awarded a handsome trophy. Then there will be a point trophy for the first three boats in the



Merry Sunshine, Otis H. Cutler, Owner. 60 Ft. x 13 Ft. x 5 Ft. Two 6-Cyl. Sterling Engines, 250-H.P. Designed by J. Murray Watts, and Built by Smith & Williams



Consuelo, 110-Foot Seagoing Cruiser, J. Percy Bartram, Owner. Two 160-H.P. Speedways. Designed by J. Murray Watts, and Building by Lawley

cruisers, the open boats and the glass cabin class, which score the highest number of points during the season.

Instead of holding the championship races of the Delaware River in conjunction with the week of Vacation Cruise, as was the case last season, the regatta committee of the Association has set aside separate dates for championship contests for cruisers, express cruisers, open boats and glass cabin boats. Another contest which has not appeared on the schedule for some time is the race from the vicinity of Philadelphia to Cape May. The cruiser contest, scheduled for Friday, August 3d, from the anchorage of the Camden M. B. C. to the Corinthian Y. C., of Cape May, is a new contest. The reason for the race is to get out every available boat for the competition for the third leg of the Coxe-Hall Trophy contest, which will be held on Saturday, August 4th, under the auspices of the Corinthian Y. C., of Cape May.

The Delaware River Yachtsmen's League schedule is as follows:

June 23d.—Outing to McIntyres Island.
July 2d.—Race-meet from Trenton Y. C. to Riverside Y. C., all classes.
July 4th.—Flag raising and club races of the Riverside Y. C.
July 14th.—Wissinoming Y. C. and the Columbia Y. C. race-meet.
August 18th.—Chance race from Columbia Y. C. to the Trenton Y. C.
September 8th.—Race-meet between the Farragut Sportsmen's Association and the Camden Y. C.

The schedule of the Delaware River Y. R. A. is as follows:

June 8-9th.—Yachtsmen's Club cruiser race to Overfalls Light Vessel and return, starting and finishing at the Riverside Y. C.
June 30th, July 1st-2d.—Three-days' cruise of the United Boat Club, of Wilmington, starting at Wilmington, going to Trenton and finishing at Riverside Y. C.
July 4th.—Club races of the Riverside Y. C.
Friday, August 3d.—Camden M. B. C. cruiser race to Corinthian Y. C., of Cape May. Sanctioned championship cruiser race of the Delaware River.
Saturday, August 4th.—Coxe-Hall Trophy cruiser race over course of the Corinthian Y. C., of Cape May.
August 18-26th.—Week of Vacation Cruise of the Delaware River Association, starting at Delaware River and terminating at Baltimore.
Sentember 8th.—Ship John Trophy cruiser race, starting and finishing from the Salem Rod, Gun and Y. C.
Saturday, September 15th.—duPont Trophy cruiser race, starting and finishing from the Riverside Y. C.
Saturday, September 22d.—Special speed-boat race, starting and finishing from the Camden M. B. C.
Saturday, September 22d.—Glass cabin and open boat championship of the Delaware River, starting and finishing from the Keystone Y. C.

The Vacation Cruise

The second annual week of Vacation Cruise of the Delaware River Y. R. A. will get underway on Saturday, August 18th. The arrangements call for a week of cruising and racing on Chesapeake Bay. Added to this will be the interassociation contest between the Delaware River and Chesapeake Bay Yacht Racing Associations. To bring the affair into the limelight and make it the best ever, the thirty or more cruisers affiliated with the Delaware River Power Squadron, and the boats holding membership in the Washington, Annapolis and Patapsco divisions of the United States Power Squadrons, will participate in the cruise and hold competitive drills at about the same time that the other squadrons are going through maneuvers in the vicinity of Maine, on the Great Lakes and on the Pacific Coast.

The first annual Vacation Cruise of the Delaware River Association to the South Jersey Coast last season was such a success and such an interest was displayed, not only by the local yachtsmen but by the skippers of South Jersey, that the chairman of the regatta committee, Commodore John B. Yarnell, working in conjunction with President Albert B. Cartledge, arranged for the trip to Chesapeake Bay, in order to give the yachtsmen new hunting-grounds and further advance the idea of cooperation and the good fellowship movement which has been the keynote of progress of the Delaware River Association. President Cartledge, since participating in power-boat racing, has always been a keen follower of the sport, and his activities on Chesapeake Bay in the several cruises held by the Maryland boatsmen prompted the local association to cruise to Chesapeake Bay. When the Maryland shore-folks learned of the proposed cruise of the local organization, Stuart Stevens Scott, secretary of the Chesapeake Bay Association, was sent as a representative to the monthly meeting of the Delaware River Association in an endeavor to have the Delaware River skippers cruise to Chesapeake Bay and participate in the Week of Cruise which is scheduled to start on July 21st. But since arrangements for the local cruise had been arranged, the invitation could not be accepted by the entire body. Mr. Scott then stated that an endeavor would be made to change the date of the Chesapeake Bay cruise so that it would coincide with the Delaware River dates and that the two sections could hold one big cruise. Even if arrangements cannot be made there will be a sufficient number of Delaware River boats on hand when the Chesapeake Bay cruise gets underway, and when the Delaware River cruise reaches the Maryland shores there will be a majority of Chesapeake Bay boats on hand to participate in the cruise and drills which will be held to make both events a success.

Commander M. E. Brigham of the Delaware River Power Squadron is making arrangements for the cruise and drills of the boats to Chesapeake Bay in conjunction with the week of cruising and racing of the Delaware River Association. Chief Commander Upton of the United States Power Squadrons has made arrangements for the combined drills of the squadrons in the South, the North, the Great Lakes, and the Pacific Coast at the same time. Officers of the parent body will be on hand to give a mark of efficiency at the four drills, and the squadron getting the highest mark for the drill will be awarded the gold medal, emblematic of leadership and the highest point of efficiency.

The schedule of the Delaware River Association cruise has been so arranged that the drills of the Power Squadron will be held in conjunction. Two-days' time is given those who will participate in the cruise and drills to arrive at the rendezvous at Betterton, Md. On Saturday, August 18th, the first rendezvous will be at the entrance of the Delaware and Chesapeake Canal, at Delaware City. Shortly before nightfall, those boats which are on hand will go through the canal to Betterton. After laying to at Betterton on Sunday, the cruise will officially open on Monday, August 20th, when the first race of the cruise will be held from Betterton to Annapolis. The distance will be 34 nautical miles and the boats will be sent away together, the time allowances being deducted from the elapsed times at the finish.

The first drill of the Power Squadrons will be held

on Tuesday, August 21st, at Annapolis. The Annapolis, the Patapsco and the Delaware River Squadrons will participate, while the other boats will go for pleasure trips in the near vicinity. On Wednesday, August 22d, there will be a cruiser contest from Annapolis to Solomons Island, a distance of about 43 nautical miles. At Solomons Island the Washington Power Squadron will join the cruise. On Thursday, August 23d, the big drill of the Southern division of the United States Power Squadrons will be held, from Solomons Island to Cambridge, a distance of 36 nautical miles.

Although Friday, August 24th, has been set aside as visiting day, no doubt another big drill will be held. The best race of the cruise will be held on Saturday, August 25th, when the cruisers will run from Cambridge to Baltimore, a distance of 52 nautical miles. After a night of entertaining and visiting the cruise will officially close on Sunday, August 26th, and the yachtsmen participating will start back home feeling happy after a week of cruising, drilling and racing, which will no doubt far outsurpass anything which they had looked for in the way of pleasure and true enjoyment.

A. P. B. A. Handicap Rule

THE Executive Council of the American Power Boat Association, at a meeting held recently, adopted two separate plans for handicap racing. At the annual meeting of the Association, held last October, the delegates after a full discussion directed the Racing Commission to prepare plans for handicap racing and report to the Council. The Council was authorized to make such plans a part of the racing rules of the Association.

The two plans which have been adopted are as follows:

PERFORMANCE HANDICAP RACES

A performance handicap race is one run strictly in accordance with all provisions for such a race as enumerated below:

(a) The course shall be an official course surveyed by an official surveyor of the Association, appointed by the Racing Commission, in accordance with Rule II, Section 2, of the Association Rules.

(b) All competing boats shall be timed by an official timer of the Association, appointed in accordance with Rule II, Section 4, of the Association Rules.

(c) All competing boats shall be handicapped on their time to cover one nautical mile in still water over an official A. P. B. A. course. This time, which shall be known as handicap time, shall be certified to by an official timer of the A. P. B. A.

(d) The local race committee shall disqualify any boat which, in a race, covers the course faster than a speed based on the handicap time.

(e) The handicap time may be determined on an official one-nautical-mile course laid out for the purpose.

(f) The official A. P. B. A. timer shall issue a statement in writing to each competitor previous to the start of the race, showing his handicap time for one mile. A copy of this statement shall be sent to secretary of the A. P. B. A. Racing Commission.

(g) No titles for championships shall be issued for performance handicap races.

(h) Competing boats will be amenable to all of the A. P. B. A. racing rules, with the exception of those pertaining to measurement, handicapping and classification as provided above.

(i) Local race committees should provide courses and the time of starts for performance handicap races so that the conditions will approach those of slack and smooth water as nearly as possible.

The alternative plan is as follows:

It is essential under the following rules that all races should be run at least three times, preferably five times, around the course.

RULES

1. Each contestant shall, before the race, state to the handicapper the time within which he elects to run the race; this, however, should be at least 2% below his known maximum speed and not more than 10%.

2. Should any contestant's speed for the race exceed by 2% the time handed in, such contestant shall be disqualified; or should any contestant's speed for any single round exceed by 2% his average speed for all rounds, exclusive of the first, he shall be disqualified.

3. Should any contestant's speed for the last round fall below his average speed for all rounds, exclusive of the first, by 2%, he shall be disqualified, unless it shall be the unanimous judgment of the racing committee that such slowing up was not for the purpose of affecting the result of the race.

4. Each contestant shall be permitted to control the speed of his boat within the limits specified and he shall be permitted to carry a stop watch.

At the October meeting it was the general opinion of the delegates that the rating rules, especially for cruisers, unduly favored boats of lower rating against those of higher rating. The Racing Commission was directed to consider the matter and report to the Executive Council, with the result that a new rule for the rating of cruisers has been adopted. This is as follows:

$$\text{Rating} = 11 \sqrt[4]{\frac{\sqrt{\text{L.W.L.}} \times \text{H.P.}}{\text{M.S.}}} + 11.$$

To change the existing rating of a cruiser to the rating under the new rule, simply divide her present rating by 18, then multiply the result by 11 and add 11 to the product.

The Racing Commission also suggested other changes, which have been adopted by the Council and which will be embodied in the Rules of 1917. The formula for determining the horsepower of engines in the express cruiser division will be the same as that for engines in boats of the displacement racer and hydroplane type. This is—area of one piston, multiplied by number of working pistons, the product multiplied by the length of stroke in inches, and the total divided by 9.

A cruiser is now defined as a power boat whose rating does not exceed 7½ times the square root of the water-line length, as calculated by the formula for determining the rating of cruisers, with berths and fixed and sanitary plumbing, etc.

An express cruiser is to be defined as a cruiser, except that the minimum water-line breadth restriction shall not apply, and that the required height of space shall be 12½% instead of 16%, up to 6 feet for one-sixth the water-line length and one-fourth the maximum breadth, and the rating may exceed 7½ times the square root of water-line length.

The express cruiser class shall also include those boats which would normally fall in the cruiser class except that their rating exceeds $7\frac{1}{2} \sqrt{\text{L.W.L.}}$

A Modern Noah and His Ark for Lost Souls

By Charles Alma Byers

ONE of the strange sights to which is attracted the attention of the thousands of passengers sailing in and out of the San Pedro Harbor, the seaport for the city of Los Angeles, Cal., is the institution known as the Seamen's Bethel Mission—a sort of "Ark for the saving of lost souls of the deep," as some one has termed it. The mission building is an odd structure built on the hull of an old tugboat, which, in its halcyon tug days, was known as the Warrior. In fact, on its bow the name still endures, although so weatherbeaten as to be all but indecipherable. Beached on the sand in an arm of the harbor, where the low tide leaves it high and dry, today the old hulk, with its additions and alterations, is suggestive of an old-type double-deck passenger boat, of rather crude construction.

It is now sixteen years since the old tug chugged and sputtered about on the waters of the harbor. Replaced by a new Warrior, it laid for two years idle, and then one day the owner, to get rid of it, gave it outright to Charles Farr, a mission worker among seamen, who made it over into an odd mission ship. The old engine and boiler room was converted into a chapel, and here on Sundays Superintendent Farr has conducted religious services for the past fourteen years.

Charles Farr, usually honored with the title of "Captain," is a character no less interesting than his Ark-like mission structure. Twenty-odd years ago he was an ordinary deckhand on the steamers of the Great Lakes. He himself admits that he was typical of the men of such calling, and that he drank his share of liquor and possessed an enviable command of blasphemous English. But one night he strolled into a Salvation Army meeting in Cleveland and became converted. Finally, he married, and, ultimately, on account of his wife's health, he went to the Pacific Coast. He located in San Pedro a little more than fifteen years ago, and since then has been a familiar character around the harbor, ever trying to interest seamen in religious matters.

Acquiring the old Warrior tug, he established the Seamen's Bethel Mission, which he has since conducted without other than financial assistance. For a while it was operated as a place of worship only, but later, on account of limited financial support, he converted the old hulk into a sort of combined mission, clubhouse lodging place. To provide room for carrying out his plan, he eventually built a second-story addition on the hull and considerably changed the interior of the original. He fitted up a club reading room and put in various games of amusement, such as deck quoits, bean board, Manhattan pool, dominoes, checkers, etc., as well as bathrooms and a gymnasium. The top floor was set aside for sleeping quarters, fixed up in stateroom style, with a large community kitchen in one end.

A small charge is made for the lodging rooms, and the money thus received, together with donations from persons interested in his work, supports the institution. Seamen only are taken as lodgers, and Superintendent Farr divides his time between acting as manager, chambermaid and missionary, always delivering on Sunday a sermon to such of his lodgers and other water-men as he can induce to assemble in the boiler-room chapel. He owns a small, crudely constructed gasolene launch, and with it he regularly visits the crews of all boats entering the harbor, distributing books, magazines and religious tracts; and if any of them seriously requires a little loan and seems deserving, he is always ready to help them out. "Captain" Farr is virtually the whole Seamen's Bethel Mission institution, from sole manager and preacher to general factotum; and yet, with a small but completely equipped printing plant "on board," he still finds time to publish many of his own tracts. The beaching of the old tug was maneuvered by himself alone, and all alterations made in it represent his own work.



Captain and Mrs. Farr



Tug Warrior, now the Missionary Boat



The Sky Pilot

Biography of an Old Sandbagger

By F. T. Lander

THEY say a man is as old as he feels. To the man interested in boats a mere matter of years means naught, for his feelings are ever young. Should Dull Care heave his hook nearby, the boatman starts thinking of that last cruise or the one to come, or perhaps the new dream boat, and then it's all off—the rough spots immediately become smooth and things in general take on a better aspect.

This matter of keeping one's youth applies at times to the boat itself. How often do we hear of some old craft still in service at the age of twenty-five or thereabout! Such boats were built to last, with materials and workmanship of the best, and if properly cared for should keep going for many a year to come.

The half-century boat, however, is indeed a rarity, but we have one in mind whose keel was laid just forty-nine years ago. Thomas R. Webber, of New Rochelle, well known as a builder of smart craft, launched this boat in 1868, and after a rather varied career we find her back again within a mile or two of her birthplace as hale and hearty as one would wish.

The boat is a relic of that remarkable class of sandbaggers which long ago became obsolete. Never has a type reached such a high stage of development as these old skimming dishes. Here was a model whose breadth was approximately half its length, plumb at ends, shallow of draught and slack of bilge. Both the cat and jib and mainsail rigs were popular, but in either case the sail area was truly enormous. Movable ballast in the form of sand bags, augmented by a husky crew of usually one man to every 2½ feet of length, were the means employed to steady these tender craft.

Aside from the age there are many other features connected with this boat that are interesting if not unique. It seems that Captain Webber in his early days had been a house carpenter, and during the progress of one of his contracts he busied himself after hours in building a boat to conform in every way to certain ideas that were all his own. The old salts of the neighborhood upon hearing of this new craft became interested, and it was only natural that they should pronounce it a failure, for not only was the model a departure from anything they had seen, but the fact that it was being built by a house carpenter was sufficient reason in itself to condemn it beyond hope.

At last the launching took place and then the spars were gotten out. About this time a Mrs. Annie Thomas, who lived with her husband on a nearby island, now called Glen Island, heard tales of the new craft, and in what might have been a sporting spirit sent word to the builder that if he would fetch his boat around she would make it worth his while. This was done and after a thorough inspection Mrs. Thomas made the proposal that if the boat was named Annie, after herself, she would donate the sail. Captain Webber closed the deal with considerable despatch, for a rig such as he intended carrying meant an outlay of some $60 or $70.

Then the first race took place and the crowd gathered to witness the predicted drubbing. Disappointment reigned, for it soon became apparent that the Annie not only was holding her own but was working out to windward, and when finally the race was over with the new boat a winner there was many a puzzled mariner.

Such men as Captain Webber, who strike out boldly from what is considered the standard practice, often do more to advance and develop a sport than the old hand at the game. Here in the first race with his first boat the Captain had proven his ideas and theories to be sound. His reputation was made then and there with the result that he instantly turned from house to ship carpenter.

Keen, shrewd and original in his capacity as boat-builder, he was equally so when it came to sailing them, and the very men who scoffed at his first venture soon became his staunchest backers, for they found the Annie with her builder at the helm a combination upon which they could well stake their last cent. Had the Annie been a failure it is safe to say that house carpentry would have continued as the vocation of this man, with a consequent loss to the sport resulting also in the fact that such splendid craft as the Madrine, Dragoon, Surprise, Huzzar and many others would never have taken form.

In the early seventies the boat was purchased by John Blizzard, who continued to race her, and after an



May F., in Her Prime



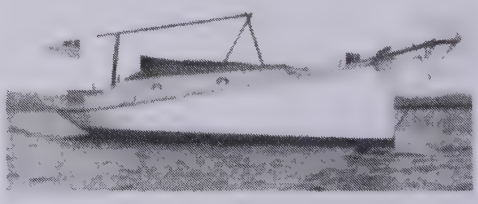
May F., About 1887—About 19 Years Old

ownership of some five or six years she was sold to George Grieve, of the Knickerbocker Y. C., who renamed her the Adele. Prize after prize was captured and not a few were in cash representing upward of $1,000. It is said that a new record was established over the Knickerbocker course that has never been equaled.

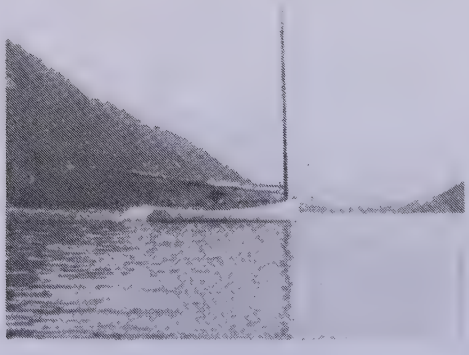
For a short time the boat was sloop-rigged and although only 24 feet over all she had a sail spread extending over a distance of 56 feet from tip of bowsprit to tip of boom. The mast was 33 feet above deck and the mainsail had a hoist of 25 feet with a high peak supported by a gaff of 20 feet 6 inches. The boom was 28 feet. There was a crew of ten men including the skipper, and each one had his particular duties. The breadth was 12 feet with 2-foot decks on which to pile the bags. There were forty in all, each weighing about 50 lb, and every time they came about the ballast was shifted. The sheet tenders had no easy time of it either, for the boats had to be nursed when the wind became fresh and it was seldom deemed safe to resort to the cleats.

The boat changed hands again in 1885, this time to William France, of Piermont, N. Y., who gave her the name by which she still is known—May F. The new skipper was Albert Styles, also of Piermont, who had a picked crew of local boatmen. For the next eight or nine years they met all comers and never was a race lost unless due to some fluke or uncontrollable accident. She was raced from Newburgh to New York Bay, and before each event was dried out for a day or two and a new coat of pot lead applied. Her racing sail was unbent after each regatta, for she not only was the pride of Piermont but of all Tappan Zee. Even today the old settlers will tell you thrilling tales of how the trick was turned in this race or that.

Captain Styles was well versed in the workings of the Hudson River tides and this knowledge was put to good advantage. Not only was he resourceful in this particular but he possessed ability in handling sailboats that could be matched by but few. His boat must be kept up to the minute; everything shipshape and Bristol fashion, and even the crew had their suits of white canvas. An instance of the way this man outgeneraled the fleet came about in a race from Grand View off the Tappan Zee Y. C. to Yonkers and return. The May F. was in the lead and just before reaching the lower mark a heavy thunder-squall came rolling over from the West. Instead of dousing sail and anchoring as did the other boats, Captain Styles managed to stagger around the mark and under greatly reduced canvas worked his boat across under the lee of the Palisades. During this maneuver there were frequent times when a capsize seemed imminent, and with the terrific downpour and constant shipping of water which necessitated lively work with the buckets, it was a relief to all hands when finally they came to anchor.



May F., in 1908—Converted Into a Power Boat



May F. Off Anthony's Nose, Hudson River, in 1907—39 Years Old

No sooner had the fury of the storm abated when the sail was clapped on her once more and into a piping Northwester she headed, with the advantage not only of a whole leg to windward but the first of the flood making under her.

Before the rest of the fleet had reached Dobbs Ferry the May F. had passed Irvington and from here on the water became unusually rough, owing to the stiff breeze sweeping across the Tappan Zee. But under such conditions she displayed an unusual trait, that of being able to edge up to windward when dropping into the trough. Whether the design of the boat had anything to do with this or whether it was the result of being able to hold on without any apparent sag to leeward is a question, but the fact that Captain Webber had modeled the boat so that the shape of her underbody would remain as nearly uniform as possible, regardless of heel, may have had some effect in creating such remarkable performances when on the wind in rough water.

The last race occurred about 1894, in New York Bay.



May F. at the Stuyvesant Y. C. in January, 1917—Aged 49 Years

There were one hundred and three starters, mostly sandbaggers of the various classes, together with a few cabin boats. The May F. had established her lead when suddenly in the freshing breeze the mast that had served her so well was carried away at the deck. This ended what perhaps was the most remarkable racing career that may be accredited to any boat. Here for a full quarter-century she had held her own against all comers and regardless of ownership, locality or age had won practically every race in which she had been entered.

Owing to circumstances in connection with her management, coupled with the fact that the sport began to wane, the broken spar was never replaced, and for years the boat was allowed to lie neglected, exposed completely to the elements on one of the wharves at Piermont. Under these conditions she began to deteriorate rapidly and at the end of a decade this splendid craft presented a forlorn spectacle indeed.

Just before she was about to fall apart, for the fastenings were gone and decay had made serious inroads, the writer obtained possession of her and proceeded to rebuild. So extreme was her condition that the only members that could be saved were the keel, three pairs of frames forward, and the majority of the plank, which was of cedar. New frames were placed between what remained of the old ones before renewing the latter and by carefully fashioning the stem, transom and deadwood from what was left of the respective parts, the original shape of the boat was saved. In addition to new decks a trunk cabin was installed and also a 6-h.p. engine, and for the next few years the boat was used as an auxiliary until finally the rig was removed altogether.

New Rochelle May 12th 1905

Mr H. J. Lawder

I do not remember of ever building a yacht named "May F" I built a Cat Boat Called the "Annie" after called "May F" she was 24 feet over all 12 feet Beam Built 1865

C. B. Webber.

Captain Webber's Testimony

Shortly thereafter she again changed ownership and was taken around to LeRoys Bay, Long Island Sound, where she has since been; her anchorage being off the home of the Stuyvesant Y. C. One of the accompanying photographs shows the boat as she was last Winter, and from the care displayed in protecting her from the storms it would appear that she will surely exist for an indefinite period. This is substantiated by the fact that Captain Webber, in a recent conversation, averred that stock of a quality similar to that from which both keel and planking were cut, had been known to last for a period of one hundred years or more.

While there may be a small boat or two still in existence that could claim an age comparable with the May F., it is doubtful indeed as to whether the proofs could be recorded with the same degree of accuracy as has been possible in this particular instance.



Mildred & Grace, S. W. Eccles, Owner. Designed and Built by the New York Yacht, Launch & Engine Co. 35 Ft. L. O. A., 9 Ft. Breadth, 3 Ft. 6 In. Draught. A Model F-8 Sterling Drives Her 14 Miles per Hour

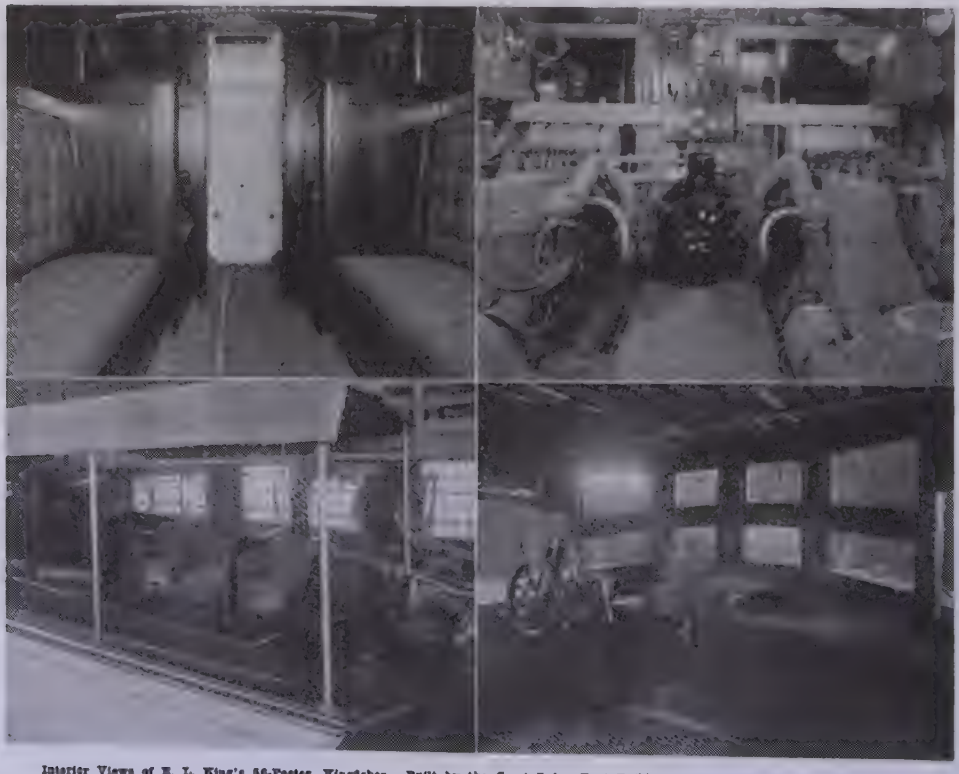
Kingfisher, Commodious and Fast

KINGFISHER is the first big boat of 1917. She was launched at Jacksonville on January 28th, where she had been shipped to from the plant of the Great Lakes Boat Building Corporation at Milwaukee. She was delivered to her owner, E. L. King, of Winona, Minn., and Daytona, Fla., and has been in constant use since then.

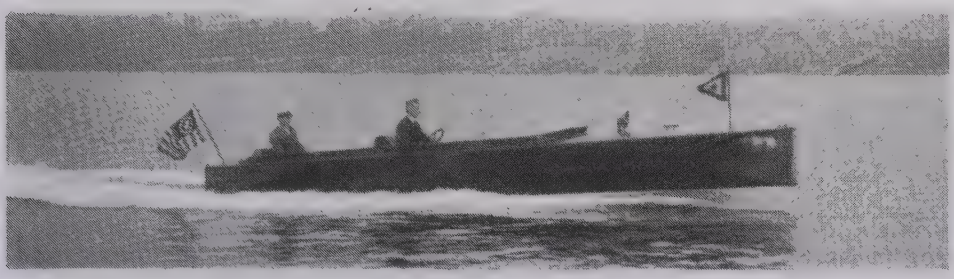
This yacht is 56 feet long, 11 feet breadth and 26 inches draught. Walter Beauvais, chief engineer and designer for the Great Lakes Company, went to Jacksonville and personally superintended the launching and the subsequent trials. A speed of 26 miles an hour was obtained over the measured mile course at Daytona.

By clever arrangement of the interior, accommodations for a party of eight and a crew of three are provided. The galley is at the forward end. On the port side is a stove with oven on one side, and on the starboard side a sink with running hot and cold water and a fireless cooker concealed under the copper-covered sink-top. There is ample provision for the storage of pots, pans, dishes and provisions. A large hatch directly overhead, in addition to the ports, gives perfect ventilation. Aft of the galley is the main cabin which is furnished with box-spring transoms on each side, the backs of which are arranged to swing up, forming upper berths. The engine space is amidships under the raised trunk and bridge deck. The power plant consists of two six-cylinder, 6 by 6-inch Van Blerck engines, both equipped with two-unit Leece-Neville electric starters. All controls are centered on the bridge. An independent Delco generating set provides current for lighting the yacht completely, in addition to operating the fans, and the 1,500-c.p. Carlisle & Finch searchlight. Berths for the crew are in the engine room, one at the forward end and one on each side.

The owner's quarters are aft under a raised trunk.



Interior Views of E. L. King's 56-Footer, Kingfisher. Built by the Great Lakes Boat Building Corporation; now in Florida Waters



Amorita, W. T. Randolph's Semi-Speed Runabout. 28 Ft. Long, and With a 40-H.P. Mason Engine Makes 28 Miles per Hour. Designed by Frederick K. Lord

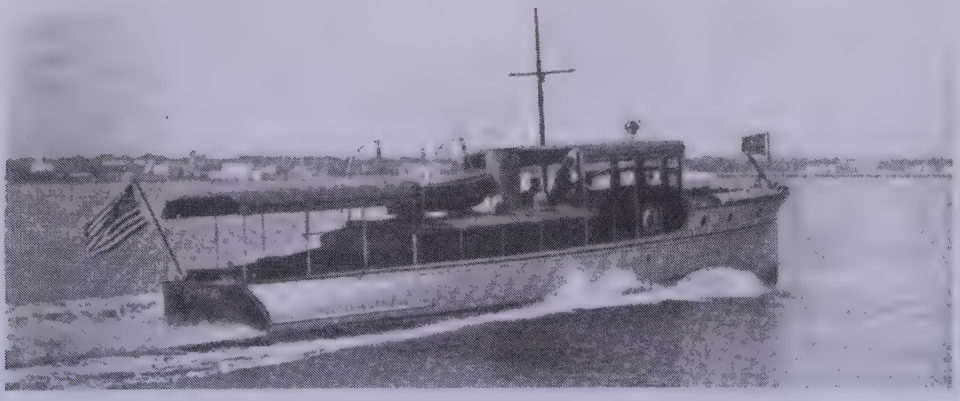
At the forward end is a lavatory with a connecting shower bath. On the opposite side is a large combination wardrobe and dressing room. The stateroom is fitted with two extension berths. Two steps up from the owner's room lead to a large and comfortable cockpit which, except for the deep leather upholstered seat extending across the stern, is furnished with wicker chairs. The cockpit and bridge is very roomy and has a wide upholstered seat which can be made into a berth for outdoor sleeping when wanted. Both the bridge and the cockpit can be completely enclosed in inclement weather.

Houseboat Gadfly Launched

Three yachts are being built at Kyle & Purdy's yard at City Island from designs by Gielow & Orr. These are a 145-foot cruiser for Colonel Max Fleischmann, a houseboat 107 feet long for Robert K. Cassatt and a 66-foot express cruiser for E. E. Dickenson. The houseboat has been launched and named Gadfly and the others are progressing well.

The Gadfly is 107 feet 3 inches over all, 101 feet 6 inches on the water-line, 20 feet 6 inches breadth and 3 feet 6 inches draught. The vessel is constructed of wood in a thoroughly substantial manner and combines the seagoing qualities of a good power yacht with the more material comforts of a houseboat. The lines combine perfection of seagoing qualities with a minimum draught, and if it were not for the square windows would show all the characteristics of a seagoing power yacht. These windows, however, add much to the owner's comfort, both in regard to light and ventilation, and because of the fact that the yacht is to be used in Florida waters it was deemed best to use them instead of the very much smaller circular air-ports.

The interior finish of the craft is in panel work. The owner's and guests' quarters are in the after part of the vessel, consisting of two large and three smaller staterooms, the two large rooms having each a floor space exceeding 160 square feet. Each will be fitted with twin brass bedsteads, upholstered transom, with locker under same on each side; a bureau and dressing table with mirrors, large wardrobe on the starboard, and on the port side a bathroom, with door connecting with



Kingfisher, 56 Ft. L. O. A., 11 Ft. Breadth, 26 In. Draught. Power, Two 6-Cyl., 6-In. x 6-In. Van Blercks; Speed 26 Miles. Owned by H. L. King, and Built by the Great Lakes Boat Building Corporation

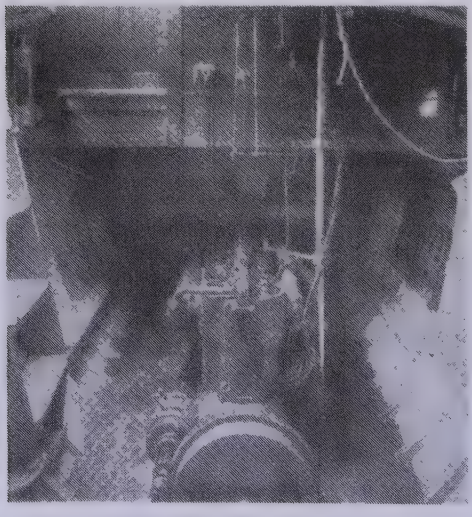
each stateroom. The three smaller staterooms connect with two complete bathrooms. Each of these rooms is fitted with a bureau, wardrobe and upholstered seat, with locker under same. A passageway runs along the center line of yacht. There is a companionway in this passage, with entrance to the living room in deckhouse.

The deckhouse is 46 feet long, with a pantry in the forward end about 10 feet long, followed by the dining room about 16 feet long, arranged with extension sideboard, buffet, etc.; the rest of the space, 20 feet in length and full width of deckhouse, is taken up with a social hall, or living room. There is an entrance to the living room from the deck on the starboard side. The bridge or steering platform is fitted on top of the deckhouse and will have brass rails on stanchions forward of same, to which canvas weather cloths will be attached

The propelling machinery of this vessel consists of two of the latest design, six-cylinder, 6½ by 9-inch Winton engines, of 75 h.p. each, which will drive the vessel at a speed of 12 to 13 miles an hour. The shafting is to be of Tobin bronze and the propellers of manganese bronze, designed especially for the yacht. The gasolene tanks are of large capacity, in order to give the boat good cruising radius, and ample freshwater tanks are provided. The tanks generally are cylindrical, arranged to work under the air pressure, thus providing for running water throughout the vessel. Among other mechanical features provided are an electric lighting plant, searchlight, electric pumps and compressors, storage battery and thermofan system for heating, cooling and ventilating the yacht.

The yacht will be supplied with four small boats, two having engines. In fact, the equipment throughout is most complete, and with provision made for every emergency.

When the Gadfly was launched she was completely equipped, and an hour after she had been in the water she took on a supply of fuel and started on a cruise South.



Engine Room of the Emoh III



The Well-Fitted Galley of the Houseboat, Vagabondia

Amorita, Semi-Speed Runabout

Amorita is a semi-speed mahogany runabout built for use on the Hudson River and launched September, 1916. She was designed by Frederick K. Lord, N. A. of New York, and is owned by W. T. Randolph of the New York M. B. C.

She is 28 feet long and has the very liberal breadth of 5 feet 9 inches over all. Of the V-bottom type she is constructed throughout with simplicity, the idea being to have a real boat. The outfit has a straight line sheer, but because of the crown to the deck it appears hogged. The model is quite flat, with little rocker to the keel. The planking is of mahogany. The decks and hatches also of mahogany are fitted tight without yellow composition in the seams. This while not making as showy an appearance requires less care and attention. The interior of the hull is ceiled in mahogany and in the engine compartment varnished finish is used on all woodwork. It is possible to wipe any oil off the varnished surfaces and no stain results, which would not be the case with a painted surface.

The engine is a four-cylinder, 40-h.p. Mason which drives the boat 23 miles an hour. It is of the all enclosed type and is fitted with rear starter, magneto, etc. The gasolene tank, 35 gallons, under the midship seat, feeds the engine by Stewart vacuum feed—an installation that has not given a moment's trouble. The exhaust line is light brass tubing with the cooling water added to cool the pipe and muffle the exhaust. No muffler is used or has been found necessary. The propeller shaft of bronze turns on three bearings, an inside stuffing box, lignum-vitae intermediate bearing, and special bronze strut near the propeller.

The equipment includes Columbian propeller, a McClellan one-man auto-top. A revolution indicator is installed on the dash. Life-preserver cushions are furnished and there is a large compartment for the storage of miscellaneous articles under the rear deck. With plenty of gasolene, Amorita is ready for a run of 3 or 300 miles. Her predecessor won the Open Boat Class of the Albany Race in 1915 as well as seven other events. The new boat will soon be out tuning up for the coming season.

Membership and Management of Clubs

IT is an undisputed fact that clubs, not of the "big stick" variety but the social organizations identified and closely allied with the sport of power-yachting, have done much toward increasing the popularity of spending our spare time in yachting. There is no better recreation nor more healthful sport than power-yachting. Proof of this may be found in its phenomenal growth and the fact that a very large proportion of the medical profession are yacht owners, and most certainly these gentlemen should know what is good for our constitutions.

There is much to be said in favor of joining a well-managed club to those who are yacht owners and even to those who take only a passing interest in the sport, for the latter will doubtless be entertained by friends who are owners and sooner or later are bound to become real enthusiasts with a strong desire to have a craft of their own.

There are a large number of clubs to choose from, near the waterfront cities, whose dues range from $1 to $200 per annum, so that any man may join the one which best suits his purse and his tastes. Of course, as a rule, the clubs that charge the higher dues have more elaborate clubhouses and give, perhaps, better service, but this rule is not infallible, for we have in mind a club with a membership exceeding five hundred who have a very large, handsome clubhouse that affords every service or facility that can possibly be wished for, and the annual dues of this club are only $12.

Many of the smaller organizations are more sociable than the so-called "high-toned" clubs, and those who fly the burgee of the former will receive the same honor and courtesy when cruising or visiting other affiliated clubs as the latter. There are a few "select" clubs who cater only to the large yachts and big spenders but there are not many in this class, for yachtsmen in general are not partial to "class" distinction; they are more unconventional and informal than those we meet in most other sports.

"It's always fair weather when good fellows get together," is the favorite song of a club we know and this is the prevailing spirit to be found in most of the organizations.

During the past year the clubs as a whole gained more in membership than in any other year in the history of yachting, and this fact is unquestionably due to the large increase in power-yacht owners having joined the ranks.

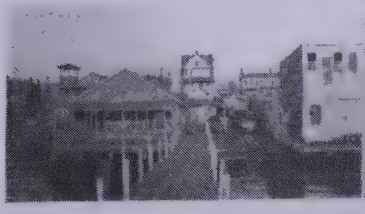
A well-organized club should endeavor to give its members all the facilities and advantages it can for its dues without recklessly running into debt, and also give all the encouragement possible to induce young men to become members, for it is the new wood that keeps up the enthusiasm and keeps dry-rot from setting in.

An excellent plan, adopted by a number of clubs, is the formation of a junior membership, whereby the young fellows are admitted without the initiation fee and at nominal dues, giving them the privileges of the club, exclusive of voting and the café, until they reach the age of twenty-one, at which time the regular entrance fee and dues are required.

The officers and the members are to blame for any club getting on the stagnant list. There are the "kickers" who are always finding fault with the management yet never attend the meetings where they might express their opinions and suggest ways and means for improvement. Then again you do not find these men, as a rule, when a general call is sent out for members' assistance to help make some needed improvements to the clubhouse or grounds when the club is not in financial condition to hire the necessary labor, neither do they dig down in their pockets for a contribution.

One enterprising club has an unwritten law that the flag officers will serve for one year only. This rule works out well where there are enough members eligible for these important positions in the club, and in this way it gives all a chance for the honor. However, there are very few men qualified to fill the chief office and when the right man is found to take the wheel it is better to keep him on the job than to experiment with unknown pilots who may run the ship on the rocks.

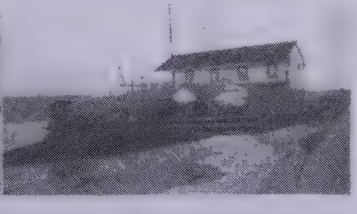
A good secretary is hard to find. A man adapted to fill this job properly must spend considerable time in the performance of his duties and it is the custom in many clubs to include a small salary for this work, which any good secretary will more than earn if he does the work well.



Arcanum Y. C., Bath Beach, Brooklyn, N. Y.



Power Dinks at the Knickerbocker Y. C. Float



Manhattan Island Y. C.



New York M. B. C. | Work-Boat Used by the N. Y. M. B. C. | Colonial Y. C.

To quote President A. L. Judson of the A. P. B. A. in his report at the last annual meeting: "My experience as your secretary during the past year gives me the right to say that in at least 75% of the clubs the position of secretary must be looked upon as highly ornamental. If my experience is any indication of the way this percentage of the clubs do business there is little wonder at the struggle of some of them for existence. Not more than 25% of our clubs have secretaries who reply on first request for information necessary for this office to have to properly conduct your business. In several instances several letters have been necessary to get information which it would take only a few minutes to give. Printed postal cards needing only to be filled out with a few words were sent for information and it took several letters at times to get them back again; some of them never came back. The other officers, particularly the treasurer and the secretary of the Racing Commission, have undoubtedly had the same experience." These remarks are exceptionally apropos and we have had the same experience.

Any club or organization to be successful must be run strictly on business principles, and officers must be selected who will attend to their duties in exactly the same manner that any other business would be run to succeed.

One of the hardest positions to properly fill is that of steward. One club tried out four last Summer, but not one of them proved to be reliable, although these men were well treated, paid better than the average, had a good home furnished to them free and were not overworked either. They did not appreciate good treatment, for they would get intoxicated on the members' private stock, become dishonest or after a short stay act as though they owned the club, much to the discomfort of all concerned. If you get a good reliable steward treat him right, pay him a living wage, and if there is too much work for one man get an assistant; but do not allow their time to be monopolized by a few members who may be excessive with their tips. A good honest steward is much harder to find than a good commodore.

The clubhouse and grounds should be made attractive and well kept up so that members will be proud of them and bring their friends, who will possibly join. Cater to the majority when running entertainments and use every effort to get out a large attendance. Make the fee as low as is consistent with meeting the expenses.

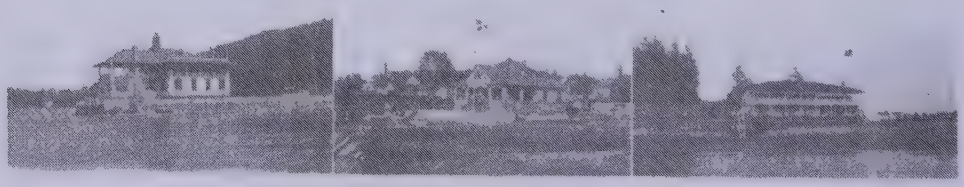
The regular meetings might be much better attended if some interesting and instructive lectures were scheduled for the same evening and then it would not be so difficult to obtain a quorum at these more or less dry and strictly business affairs.

Every member should have the club's interest at heart and endeavor to induce his friends who sail with him to sign a membership card. Yacht clubs require considerable money to maintain properly and the larger the membership the better able the club will be to increase the accommodations and give better service.

What is possible in the way of increasing the membership by a little hustling was demonstrated last year by several clubs. One of the big Long Island Sound clubs obtained over one hundred new members during the season, and one on the Lower Bay met with about the same success, while one of the smaller clubs on the Hudson River signed on sixty, of which forty were power-yacht owners.

In some localities there are too many clubs and without question much better results would be obtained if two or more of these clubs consolidated, instead of each struggling along by itself barely able to meet its obligations.

Every member of a club who pays his obligations and is in good standing should receive the same courtesy and good fellowship whether he spends $10 or $1,000 a year at the club, or who owns a 100-foot cruiser or only a little power dink, and we can positively state that this is the spirit of good fellowship which is found in our clubs with but very few exceptions.



Huntington Y. C. | Knickerbocker Y. C. | Port Washington Y. C.

Ignition—Give It a Chance

Troubles, Symptoms, Causes and Remedies

DUE to persistent effort on the part of electrical engineers and manufacturers of electrical products during the past few years, we are now able to obtain electrical units for a great variety of purposes that are inexpensive, simple, yet entirely capable of performing their intended function. Tremendous progress has been made in nearly all branches of electrical apparatus and especially in connection with component parts or units of commercial value, such as the magneto, dynamo, batteries and other units necessary to produce, generate, control and distribute the mysterious agent known as electricity to adequately meet all conditions pertaining to ignition, thus producing high operating efficiency in all departments.

We all know that a "bridge is only as strong as its weakest part," and that the weak point in this particular instance is the governing factor. Now a few years ago jump-spark coils were in a minor stage of efficiency. They produced a spark, quite true, a terrific spark at times; but don't overlook the fact that they used a great deal of battery current. Therefore, they were not economical, although otherwise they fulfilled their function. In view of this fact, electrical men set to work to overcome this very serious objection, and in a short time their efforts were rewarded by making high-tension current of sufficient density to ignite the compressed gas in the cylinders of internal-combustion engines, yet satisfactorily from the economical point of view as well. In the same way, other faults relative to ignition systems and units have been eliminated with the result that now when a man buys the product of well-established firms in this line, he is practically assured of satisfactory results.

The leading manufacturers of ignition systems and parts have endeavored—and successfully in most cases—to produce rugged, standardized units that will perform their function constantly. In the majority of cases, these manufacturers have succeeded in producing systems and units capable of "standing up" under very severe mechanical and electrical conditions. They perform their function in accordance with the conditions they were primarily designed to meet, with perhaps an overload of 50%. Right here is where ignition troubles commence. Now, as already mentioned, the designers and makers of ignitions have doped out systems to meet all existing conditions relative to the proper and positive firing in gas engines. They have incorporated stability, simplicity and stand-up-ness in their machines and accessory fittings with the all-desirable result that they are dependable under all ordinary conditions, besides having the overload capacity already mentioned of a fairly wide range. That is, the systems will more than meet the contingencies of normal engine operation under favorable conditions and possessing this flexibility, they add to the reliability of gas engines in general.

This dependability is especially desirable in the case of marine engines, for this type of engine is often isolated from the possibility of repairs and adjustments and must at times operate under decidedly non-favorable conditions. In other words these units are designed and made to meet certain conditions and with reasonable care and attention the product of recognized concerns in this line make good.

This assertion clearly emphasizes the fact that the majority of ignition troubles are caused by the controlling human element and are not attributed to faulty manufacture. If the points burn off a vibrator on a vibrating coil, it is probably due to excessive battery current or to too stiff an adjustment of the trembler. Remember that present-day standardized electrical units are the result of years of actual and technical experience. Therefore do not condemn a unit or the manufacturer until you are sure you are not at fault yourself. Of course, the "exception proves the rule" at times and we will make allowances for certain troubles peculiar to the manufacturing end.

The great majority of troubles peculiar to ignition can be avoided. The only way to avoid trouble of this kind is to know something about the why and wherefore of the various units—their relation to one another, the troubles peculiar to the parts, the detecting of these troubles, and their remedies. But besides this general information, a knowledge should be acquired of the various parts that would enable an operator to prevent trouble as far as possible.

Ignition troubles can be divided into three main divisions, i. e., (1) electrical, (2) mechanical and functional and (3) troubles due to lack of experience, lack of attention or otherwise on the part of the operator.

Therefore an operator should become familiar with the various units of his engine, should understand as far as possible why the several units are necessary, and their relation to each other in all departments. He should understand the function of the sparking system, apart and in conjunction with the mechanical and functional side of his engine. He should know something about the producing and distributing of the current to the spark-plugs, and why a spark appears at the plug and why this sparking takes place at the proper time, and what will or will not happen if it takes place at the wrong time, or not at all.

Next in importance he should know about the mechanical operation of his engine; in short, "why it operates." If he has a two-cycle engine, he should know why it is two-cycle, and if it is of the four-cycle type, why two complete revolutions of the crank shaft are required to go through the four phases necessary to produce power, i. e., (1) intake, (2) compression, (3) working stroke or power stroke, and (4) exhaust stroke. These four operations take place in one turn of the crank in a two-cycle engine.

Next to knowing and understanding these principles and with a working knowledge of how to adjust and otherwise keep the several parts of the engine in good order and adjustment, he should remember to take care of his machine. Don't get in the habit of abusing your engine just because it is always willing to go and, being inanimate, it has no way to legitimately ball you out. If drinks are in order, give your engine a little oil,

remembering it does not take much to make a gas engine happy. But unless gas engines are operated in accordance with commonsense engineering practice, they will give trouble and in common ratio to the care or lack of care they receive. Therefore, learn the few simple rules necessary to successfully operate these engines and then painstakingly put these rules in practice and adhere to them closely on all occasions and your troubles will be reduced to a minimum.

This article is primarily on ignition, but in view of certain conditions it is necessary at times to consider other departments of the engine, for similar or even duplicate troubles are sometimes directly or indirectly attributed to different sources—some electrical, some functional, and some mechanical.

The following information will clearly illustrate this point and will aid the operator in determining the trouble at hand, by recognizing the prevailing symptom and suggesting the proper means of adjustment by specifying the remedy necessary.

To begin with ignition troubles, we will assume that your engine is apparently O. K., and you have already taken care of the starting preliminaries, i. e., that you have sufficient fuel on hand, also an adequate amount of lubricants, that the lubricating system is in order, and all lubricating devices filled and adjusted. That fuel is turned on at tank and carbureter and needle valve set at low working revolutions and throttle half open. That ignition control is retarded so that sparking will take place after the piston has started down on the working (power) stroke. This is a "Safety First" precaution to eliminate the possibility of kick-back and the dangerous consequences. Some engines that have not been operated for some time, hours or days, as the case may be, require priming; that is, injecting a little gasolene into the cylinders. This gasolene readily mixes with the air in the cylinders, providing the cylinders are not flooded and there is no dampness. If after repeated cranking, the engine fails to start, there is undoubtedly something at fault, and what is at fault is usually indicated by some symptom. For instance, suppose the engine starts, runs a few revolutions, and stops. This indicates that the ignition is apparently O. K., but that the cylinders are not getting the right amount of fuel. If under the foregoing conditions the engine stops, accompanied by backfiring, a weak mixture is indicated. On the other hand, if the engine slows down and stops in a sluggish manner, it indicates an overrich mixture. If the engine does not start at all, it may be due to non-ignitible gas in the cylinders, but it is more liable to be caused by an open or short circuit; for instance, battery switch out of contact or making poor contact, broken wires, loose connections, in either primary (low) tension or secondary (high) tension circuit. Coils out of adjustment, tremblers stuck, points pitted, timer or circuit-breaker at fault, weak batteries. The foregoing have to do with high-tension jump-spark systems using a vibrating coil.

In regard to other types of high-tension systems and low-tension mechanical make-and-break, the troubles and symptoms are very similar and the variations can not be adequately handled in an article of this length, as we must also consider troubles in general. Other troubles peculiar to non-starts are lack of compression caused by loose rings, dry or scored cylinders, intake or exhaust valves pitted or not closing properly, etc. Lack of compression in one or more cylinders is indicated by lack of resistance when cranking the pistons upon the compression stroke on the one or more cylinders. If good compression is indicated by hard cranking, that is flexible, as the pistons go by the top center of compression strokes, then the non-start trouble is not caused by poor compression.

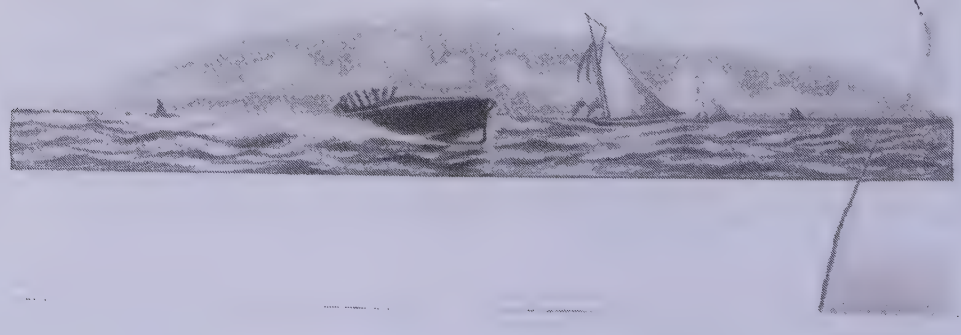
Great care must be exercised to have a well regulated and correctly proportioned mixture; that is, a suitable amount of air combined with the fuel to form a readily combustible gas. A correctly regulated mixture should exhaust a blue-violet flame from the pet-cocks when open and this flame should be accompanied by sharp-toned explosions. Bear in mind that the efficiency of a gas engine is contingent upon the proper working of all functional and mechanical parts. Therefore, a good mixture will not overcome the disadvantages of poor compression, or if the compression is O. K., a poor mixture can not produce the maximum power, no matter how large or intense the ignition spark is. Therefore, do not blame the ignition until you are sure the ignition is at fault.

Dampness in the cylinders is extremely detrimental to starting. True, it is very seldom that water finds its way into the cylinders of our present-day engines, except when they are installed below the water-line and the water is allowed to back through the exhaust.

Hissing sounds usually indicate loss of compression. Look over the spark-plugs or ignitors to see that they are tight. Perhaps some of the threads are stripped. Remember to retard ignition before cranking over to start, but when engine is in operation, be careful not to retard far enough to cause explosions to take place in intake pipe or carbureter. On the other hand, remember that an overadvanced spark will produce a knock at times, usually when the engine is operating under a heavy load.

Explosions in the muffler or exhaust pipe are quite frequently caused by the spark being too weak to ignite the gas fully and regularly, thereby allowing some gas that is not ignited to be pumped by the pistons of the non-working cylinders into the exhaust, where it is ignited by the exhaust flame of operating cylinders.

When an engine operates in a regular manner but does not develop full power the trouble is usually due to poor compression, lack of lubrication, poor mixture, not sufficient gas, overload, ignition retarded, or weak sparking, the latter being due to weak battery, dirty plugs or timer units out of adjustment, spark gap at plugs too short, oil in magneto, tremblers on coil stuck, points pitted, defective wiring, or poor switch contact.



Proper Engine Installation

By William J. Deed

IN the early days of power-yachting we used to commonly hear that the power yacht was not reliable; often one broke down and drifted out to sea, only to be picked up by some steamer or fishing schooner when the party had about reached the limit. This almost never happens nowadays and we think it may safely be said that one of the most reliable servants of man is the internal-combustion engine. Engines with splendid regularity start, alter speed at will, jump from 300 to 900 revolutions and back again in a few seconds without stalling, and possess all the characteristics and equipment of the finest automobile engine.

Much of this perfection has been attained through refinement and improvement of detail of the engine itself and much in the equipment of the best accessories. Any old wire is no longer considered good enough for the electrical work, nor is any old out-of-the-way corner good enough for the engine. For we have learned that our power plant is the biggest part of a successful yachting trip; halfway measures in installation, semi-suitable equipment mean only giving the engine half a chance, and we have learned that we must not expect the engine to operate with 100% efficiency with only 50% of a chance.

The man who has his yacht designed and built by competent men in their respective lines will get an efficient installation in 99 cases out of 100, as everything is either specified or done by capable men, but there are many yachts built and many engines installed every year by men with often quite limited experience and knowledge of this important installation work. To them an important suggestion would be to engage the agent or representative of the engine you install in your yacht to supervise or oversee the installation of his engine, since he should have more definite knowledge as to minute details to draw on than the yachtbuilder who may not have installed such a make or type of engine before. Every agent will be personally interested in the satisfactory service of his engine, and will often be glad to oversee the installation without remuneration, if the work is done where he can see it without undue expense of time or money. But it would be money in your pocket to pay him to do it and have his O. K. on the whole job before the yacht is delivered. It would pay many a small boatbuilder to figure on this slight expense rather than depend on whatever man he may happen to have working for him at the time the engine is to be connected up.

This article is not written for the man who is having a boat built by one of the leading builders, as he will get a proper installation, but it is intended for the less experienced man. And it is not intended to be any attempt at laying down the law in these respects, rather it is but a poor attempt to generalize and suggest, for the subject is too large to be treated fully in a short paper, the genesis of which is found in a talk which one of THE RUDDER staff had with the writer in his office, when some poor installations were the subject of discussion; it occurred to us that it might be well to call attention to some of the mistakes made occasionally and suggest proper installations.

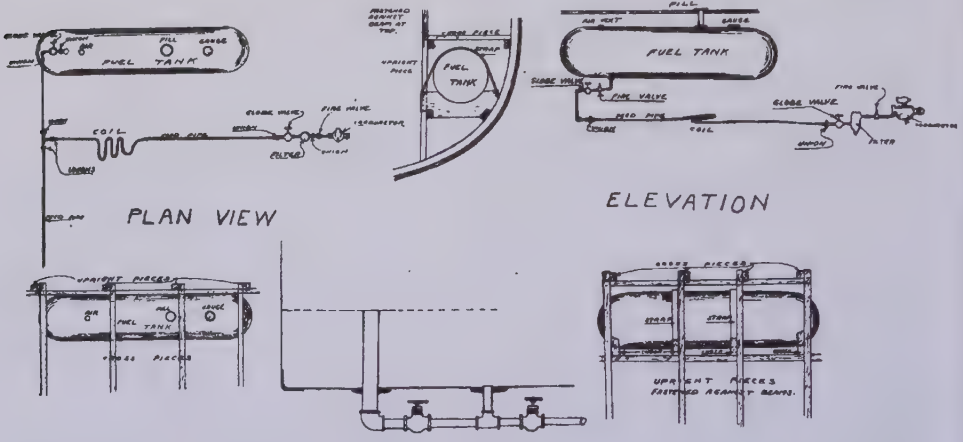
Every yacht owner demands service from his engine, he demands reliability, quietness so far as possible, smooth operation with minimum vibration and the most economy. Added to these he wants a safe plant and one requiring minimum attention. So there has been developed the clean, quiet, self-starting engine that will obey your slightest touch of the button or pressure of foot pedal, an engine that will serve you with almost the expressed devotion and reliability of a pet watch dog, that will operate so long as you feed it gasolene, oil and water. But that engine must not be stuck away out of sight, where proper attention cannot be given it. It is a piece of complicated mechanism and must not be neglected. Many a fisherman's engine is covered with fish scales and rust, but his dry batteries are there with the kick in them and the oil is suited to the engine and is kept free of dirt. Don't judge an engine by the outside, for the most polished engine may have scored cylinders or the most rusted engine the best of bronze bearings. But all else being equal, exterior cleanliness leads to interior cleanliness and good running order. Allowing the rust and grease to accumulate on the outside is, at least, a poor advertisement of the true value of the engine. So don't install the engine where you cannot get at it to properly clean it and operate it.

Every engine needs to be cared for when laid up at the close of the season, at least, and even if your engine is one of those that you can start and stop and forget, you need to get at it then anyway. So do not limit space to such a point that you can't get in alongside the machine and take down properly. An engine should be gotten at from all sides and from above. And there is no instance where we believe this impossible. Watertight hatches or sections of the bilge or cockpit decks are easily arranged, fitted with flush rings for lifting, and gutters under the seam for draining, and these should be large enough to permit a man's arm working between the engine and the side of the opening in the deck. This is assuming that the engine is installed under a bridge deck or cockpit floor. If the arrangement of the boat permits, have the engine right out where you can walk all around it. Unfortunately this is seldom possible in the smaller craft, but there is no excuse for such installations as we sometimes see.

One such we have met placed the engine, a 35-h.p. engine weighing a ton, under a bridge, the flywheel only one-half inch away from a bulkhead forward of the engine and the heads of the cylinders clearing the underside of the beams by 3 inches on an engine with an 8-inch stroke. Over the engine was a flush section of the deck which removed, but in order to lift this hatch, one must first disconnect all the fuel piping, lift off a fuel tank holding 80-odd gallons, and a seat built over it, and lift the deck section off. All this to lift off a cylinder or a piston. And the worst of it was that this removable section did not cover the forward two-cylinder casting, it being necessary even to remove a cylinder head to shift the 2,000-lb engine aft about 6 inches. And this, too, would be necessary to remove the flywheel. Engines are expected to work without someone standing over

them and taking them apart constantly—and they do it—but it is not necessary to handicap them in this manner.

When an engine is installed close under a deck, a removable flush section should be right over it, so that the whole engine is uncovered and could be lifted out bodily if necessary. Where the engine is installed under a bridge deck, it is best to have removable sections in the cockpit floor, in the aft end of the bridge deck, if this is high, and in the bridge deck so that the whole installation will be exposed completely. If there are seats in the cockpit the gasolene tanks should be installed under them and the piping run over the cockpit floor to the engine as far as possible, the exhaust running under the cockpit floor so that danger is eliminated to the greatest extent. Where the cockpit floor is high the tanks are placed under the floor well out to the side of the boat, and just as far as possible away from the exhaust pipe. Where the exhaust pipe is led aft anywhere near the fuel tanks the exhaust should be water-cooled the entire length and the water-pump should be always kept



in first-class order, so there can be no repetition of the danger which one of the small cruisers in an early Marblehead race experienced, when the water-pump choked and the exhaust pipe, normally water-cooled, became red-hot, only a few inches away from the gasolene tank, and scorched the wooden blocks under the tank.

The accessibility feature has been spoken of first, but safety is really the first consideration and this practically hinges on accessibility; the writer finds talking with many yachting men going in for a family cruiser that they have an ever-present fear of gasolene engines in spite of the few accidents with them, and in installing an engine in the very best manner we should plan to use all the safety devices that have been put on the market. Closely linked with the layout of the fuel system and the exhaust is the question of danger resulting from the failure of one or the other to work properly. Many a fire has gotten beyond control after the gasolene tanks have been drained into the bilge of the boat, when the fire could have been stopped but for this. There has been on the market a valve which is worth many times the price for the reason that it can be installed at the carbureter or at the tank, or at both places, and will shut off the flow of gasolene from the tanks after the crew has left the boat to its fate, possibly not daring or being able to shut off the gasolene. This valve is normally open and is held against closing up by a fusible link, this link being a standard article which can be bought for 10 cents and which will melt at a temperature at 155° Fahr. In fact, it can be fused by a flame from a match. Should the fire get near the tanks, this link melts and a stiff spring automatically closes the valve, shutting off all further flow of gasolene. Where a backfire through the carbureter starts the fire in the oil under the engine at this point, such a valve in the feed pipe near the carbureter would shut off the gasolene and it seems that this should be installed on all power boats. A detail that has been overlooked in one or two cases and has resulted in serious consequence has been a failure to fit a flame destroyer in the whistle installations, where the burned gas is taken from the engine cylinder. This should never be omitted, as it is not impossible for naked flame to reach the tank if the pipe is short, and the cost of this little fitting is so slight that it is absolutely foolish to be without them.

Often the fuel tanks are installed in wooden cradles nailed together with common wire nails, but needless to say, reputable builders do not fasten tank cradles this way, as the fuel surging back and forth in the tank will throw quite a strain on the fastenings of the cradle in which it rests, and the only proper fastenings to use are threaded fastenings, either bolts or screws; it is the writer's practice to always specify this, just as he does for the sheaves for the tiller-rope. With galvanized or steel tanks, it is best to have the tank cradles made of pine or cypress, or spruce, rather than oak, as the large amount of tannic acid in the oak has, in time, some action on the galvanizing.

There is always found to be more or less dampness lying close to floors or held under floors in confined places, such as gasolene tanks are usually installed in, and this dampness does not do the tanks any good, so it is the writer's practice to always specify that fuel tanks should be well coated with red lead or some cement paint

adapted to painting metals, and if this is done, it will increase the life of the tank greatly. Galvanized tanks should always be painted this way if they are to be installed in a boat, for iron touching wet wood will oxidize no matter how thick the galvanized coating.

Quite often a man will suddenly discover while a few miles from home that he has run out of gasolene, and anyone who has been through such a moment will realize what it means. But such a situation is very easily avoided by a simple manner of running a fuel feed pipe as shown in one of the little sketches. The regular outlet from the tank reaches up 3 or 4 inches above the bottom of the tank and is connected to a tee, and from the tee the feed pipe leads to the engine; this is the regular supply pipe. When the gasolene level gets below the top of this outlet you get no fuel at the engine, of course; but if you have another outlet with the top coming flush with the bottom of the tank, and with a globe valve just outside the tank, the pipe leading to the third opening of the tee, you can open the valve and get home on the fuel lying at the bottom of the tank. This is so simple and inexpensive that it is a wonder any boat is ever caught without fuel enough to get home. There should be a strainer in this emergency outlet, naturally, as there usually is more or less sediment in the bottom of the tank, but sediment or no sediment, this extra gasolene will be appreciated.

The question of which is the best fuel tank is probably as near settlement as the great war in Europe. There are three tanks usually used, i. e., cylindrical seamless, galvanized boiler, and sheet-copper with riveted and soldered joints. Each has its advantages and, to some people, disadvantages. We do not wish to thrust any personal opinion in here, but simply say that if you have plenty of room to get the required capacity use cylindrical tanks, and if you are pinched for room to get the necessary capacity have the tanks shaped to the space available, and a good, heavy-gauge copper tank with seams carefully riveted and soldered, provided with swash plates to break the force of the moving gasolene, if the tank is well placed in position, we see no reason why there should be any danger from a shaped tank.

In addition to the suggestions made we will describe an ideal installation in detail and show a plan, taking a typical outfit with gravity feed. The 14-inch by 60-inch seamless steel tanks tinned inside and out rest in spruce cradles under the seats, brass filling pipe being threaded into bushing on tank and into brass deck plate in seat top. No fuel is spilled in filling. The tank has a level indicator, air vent, and the outlets arranged as above described for providing an emergency supply. Cylindrical tanks can also be purchased equipped with reserve supply compartment at very little cost, which is quite as good as that described. The feed piping is ⅜-inch inside diameter annealed copper tubing. In only the smaller horsepowers is ⅛-inch piping used and ¼-inch size is used by some in installations up to about 50 h.p., but an extra ⅛-inch size is better than the other way. Where the feed piping comes from each tank, there should be a globe valve, fire emergency valve, a strainer or filter to remove impurities before the fuel enters the feed pipe, union, and before feed pipe enters the carbureter there should be another union, a globe valve and fire emergency valve, then carbureter. Midway in the feed pipe it should be coiled with the coil lying in a horizontal plane, so as not to have any low spot to collect sediment. Be sure to have a union at each end of the pipe, so it can be readily disconnected. Run the pipe inside the boat, never outside, and keep it protected from injury in storage spaces, etc. Yet it should be "feelable" the whole length. Install a big strainer or filter, one with a large plug at the bottom and large cylinder. Run the pipe as straight as possible with the exception of the coil to absorb vibration. Seamless tanks and seamless drawn copper tubing offer the minimum chance for a leak; in fact, it is impossible except at fittings. And these joints should be made up with shellac or common washing soap. Unions for feed piping are ground unions and require no packing. There should be a copper drip-pan under the carbureter and a pan under the flywheel to form a flywheel pit so that no water can be picked up by the flywheel and thrown all over the engine room, often putting out of commission batteries, though installed high up. This leads us to say that it is economy to have the batteries well protected in a sealed box.

In gravity feed always have the bottom of the tank at least 4 or 5 inches above the carbureter, and the further the tank is from the carbureter the greater the distance. Brass pipe could be used for the feed pipe in place of copper tubing, but the latter is best.

Coming back to our ideal installation. The cooling water is taken from outboard through rubber hose, never through solid pipe. Vibration would loosen joints around the lock-nuts if the pipe were used, so rubber hose is connected to the circulating pump inlet on the engine and with a bronze sea-cock fitted through the planking. You can buy a device embodying the sea-cock, lock-nut and strainer all in one, easily attached. The hose should not be less than 4-ply, because of the suction of the pump causing a less stiff hose to collapse. The sea-cock should be a size larger than the pipe fitting on the pump. A strand of candle wick should be wound around the nipple inside and outside the planking, smeared with white lead, and allowed to set for watertightness. Solder nipples should be screwed into the sea-cock and the hose secured to this by a hose clamp; use a hose clamp where the hose is clamped to the pump. The screwed joints should be smeared with white or red lead, linseed oil and graphite to prevent rust and make a tight joint, that can be unscrewed at will.

Iron pipe is most common for exhaust piping; steel pipe, which, unlike iron pipe, has no weld along the pipe where the joint was made, is also used, while for the best installations brass pipe makes a permanent job, though quite expensive at first. However, since the iron pipe will last four or five years without renewing, it is recommended. Cast-iron pipe fittings should be used with galvanized iron exhaust pipe; wrought-iron fittings rust. Be sure and have a pet-cock at the lowest point of the piping to drain pipe. Do not reduce the diameter of the pipe after you leave the manifold; have the muffler or silencer over-big if you want a quiet exhaust without back pressure. And rather than lag with asbestos cool the pipe by water jet into the exhaust passage, this turning to steam and reducing the temperature of the gases, thereby the volume and back pressure. A cock should regulate the amount of water going to the exhaust pipe. And the piping should be put together with unions and sockets so as to readily disconnect.

It is recommended to carry the exhaust out through the stern of the boat just above the water-line when the boat is running, but there are several good underwater exhausts on the market that do not produce back pressure.

Some engine manufacturers do not specify mufflers in

the exhaust line, figuring that, with a six-cylinder engine and a large-size exhaust pipe of great length, a muffler is not needed, but a muffler or silencer is a good means of clearing the cylinders and exhaust pipe quickly, and in the majority of cases, is necessary. The silencer or muffler should be large for the size of the engine and the fewer cylinders per horsepower the larger the muffler. One common mistake amateurs make is not to support the exhaust pipe and muffler sufficiently, the vibration causing leaks. Another thing to be careful about is not to allow any grease or oil to get on the rubber hose used in the engine installation, as oil rots rubber quickly.

There is not space to outline the proper engine bed, but we simply want to caution that if you have any oak left lying loose after you have built your hull, put it in the engine foundations, as you cannot get them too solid; in fact, the writer often fills in the space under the engine solid with oak. Hanger bolts are better than lag screws to bolt the engine to the foundation and are advised in all cases. No matter how much care is taken to line up the engine bed, it is our opinion that a flexible coupling is a mighty good thing and if the boat is a lightly built boat, that may alter shape slightly, a self-aligning stuffing-box is recommended.

Be sure to run all electrical wiring up high over the engine and use the best insulated wire, as the best is none too good. For the oil, kerosene, paint, varnish, etc., cans that you need aboard the boat, have a locker simply for them and have this lined with metal for safety; do not keep the tools in the same locker, but have a separate locker or tool rack for them. In the tool locker have a small box containing a duplicate of every type of bolt, set-screw, nut, battery connectors or spark-plug used, unions, ells, tees, cotters, washers, gasket material, beside the usual tools. If the boat has electric lights, have a box with spare lamps, fuses, wire, switches, sockets, etc., as just at the time that you will need some one of these parts it will not be aboard. Always have the stuffing-box accessible and never pile a lot of dunnage around it and over it, so that it cannot be reached; and always have an inside stuffing-box. Whenever possible, have a lubricating oil tank in the engine room that will hold a barrel of oil, if possible, as you can buy it cheaper and always have the proper kind of oil for your engine, which you might not be able to obtain in some out-of-the-way place. Also for the kerosene there should be a tank strapped under the deck, filled the same as the oil tank from the outside, and each of these tanks should have an outlet with a faucet; in the case of the oil tank the outlet might be a copper tube led to the oiler on the engine with a shut-off.

The installation of the one-man control at the wheel of spark, throttle, reverse gear, oil and air gauges, electric starter button, switches, etc., is too complicated a story for a short paper, and these are often the least understood. They should either form the subject of a complete article or you should have the engine company or naval architect furnish the drawing covering these.



Passenger Boat Suquamish, 92 Ft. Long by 16 Ft. Breadth and 5 Ft. Draught. Equipped With a 180-H.P. Nelseco Diesel Engine

Designs

110-Foot Power Cruiser

A VERY handsome 110-foot power cruiser has been designed for William Pratt by Swasey, Raymond & Page, the plans of which are given herewith. The outboard profile shows a vessel having a raised deck forward at the after end of which is a deckhouse 16 feet long, in which is the dining room. The steering bridge is at the after end of this house, which affords protection for the helmsman. On the after deck is another house, 9 feet long, from which stairs lead to the accommodations below.

Below deck the accommodations for the crew occupy space for 39 feet and consist of an officers' messroom on the starboard side, staterooms for the captain, engineer and steward. The galley is next aft and extends 6 feet fore-and-aft and the full width of the yacht.

The engine space is 15 feet fore-and-aft. It will be fitted with two 6-cylinder, 8 by 11-inch Winton engines. Two fuel tanks, having a capacity of 800 each, are placed at the sides of this compartment.

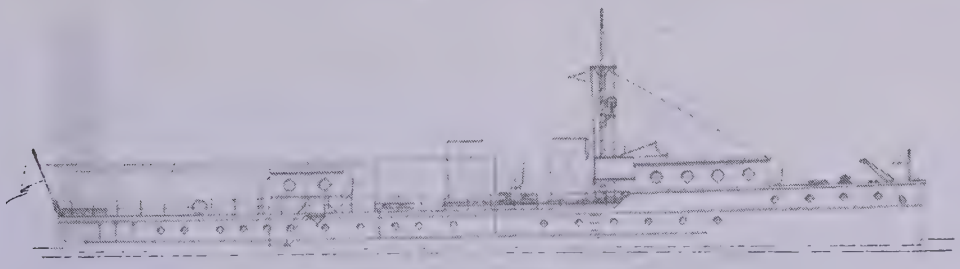
The owner's quarters are in the after part of the vessel. The owner's stateroom is aft of the engine space and is fitted with a double bed, sofa, bureau, lockers, table, and has a connecting bathroom on the port side and a dressing room on the starboard side. The main saloon is next aft and then come two double staterooms, another bathroom, gun locker and wet clothes locker.

The general dimensions of this yacht are:

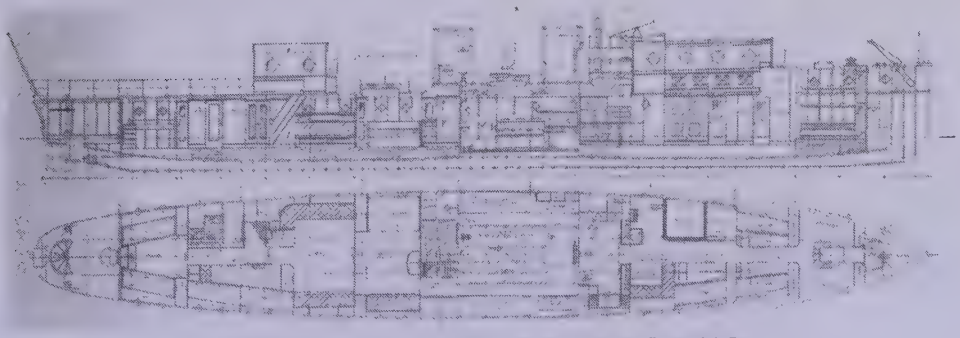
Length o. a.....	111	feet	11	inches
Length l. w. l.	110	"	0	"
Breadth	16	"	1	"
Draught	4	"	2	"

110-Foot Cruiser

A cruiser 110 feet long has been designed by the Matthews Boat Company, primarily for service on the Great Lakes but suitable for any waters. The plans are printed herewith. The construction is extremely heavy for a boat of this size. It has the double deckhouse arrangement of a flush deck cruiser. In the after house is a music room, to be fitted with piano, bookcase and desks. The dining room is in the forward house



Outboard Profile 110-Foot W. L. Cruiser for William Pratt



Arrangement Plan of 110-Foot W. L. Cruiser, Designed by Swasey, Raymond & Page

and has a pantry adjoining. The captain's bridge is over the forward house.

The accommodations below consist of a cabin, two double staterooms, two single staterooms, and two bathrooms. The engine room is amidships and provides for the installation of two heavy-duty oil engines of 300 h.p. each. The gasolene tanks are forward of the engines in a separate compartment.

The galley and crew's quarters occupy the entire forward section of the yacht and consist of three single staterooms, the forecastle and a messroom. The interior joinerwork is of Circassian walnut and mahogany. The deckhouses are of teak and the yacht has teak decks, rail and other outfittings.

The general dimensions are:

Length o. a.	110	feet
Breadth	18	"
Draught	6	"

The forward deckhouse is so arranged with the floor high enough to permit of a person seated being able to obtain a view in either direction. The sideboard has a slide to pass food through to the crew's quarters. A drop-leaf table, lockers and Victrola stand are arranged as planned. The galley floor is lower than the saloon floor. The refrigerator extends under the steps. Dresser, sink, range and a number of lockers not shown on plans complete the arrangement. Crew's quarters forward are fitted with two pipe berths, transom seats, lockers, etc.

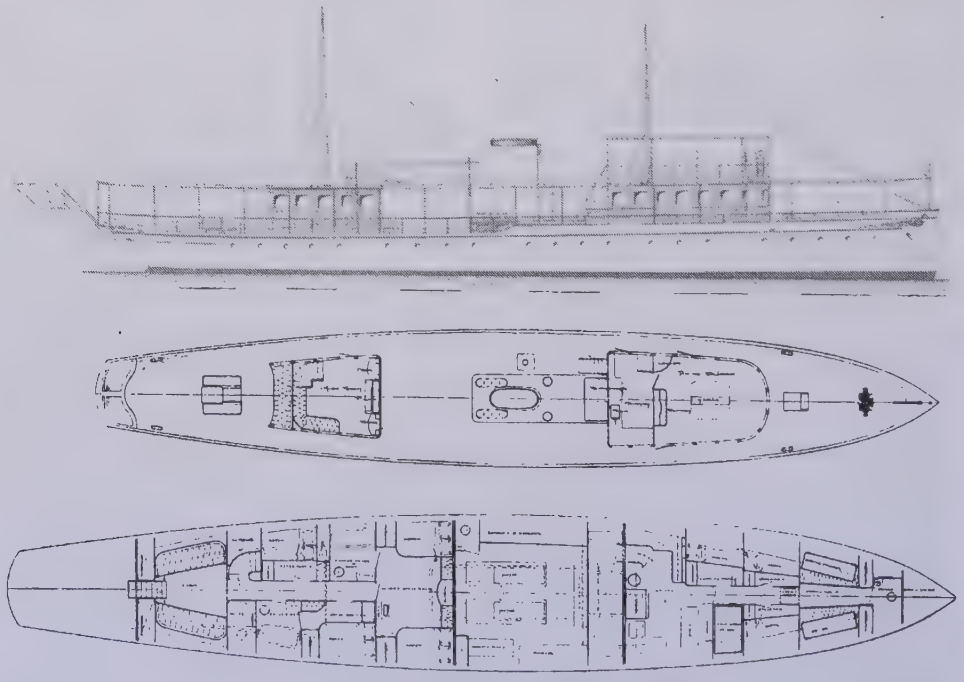
The owner's quarters aft comprise two staterooms, the forward one with double berth, divan, bureau, desk and wardrobe; the after one with two single berths, wardrobe and bureau. Drawers are under all berths. Opposite the companionway is a toilet room.

The general finish of the interior of the after quarters, white with mahogany trim; the saloon, mahogany; galley, mahogany and cypress; the crew's quarters and engine room, cypress.

The deckhouses and superstructure are of mahogany. A power and a rowing tender will be carried on davits.

The general dimensions are:

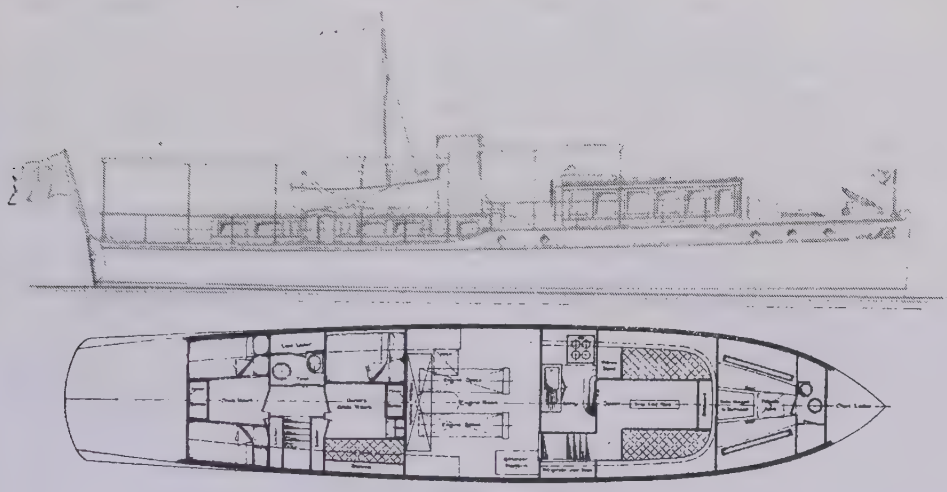
Length	67	feet	0	inches
Breadth	13	"	0	"
Draught	3	"	6	"



110-Foot Great Lakes Cruiser, Designed by the Matthews Boat Company

67-Foot Power Cruiser

The plans of the 67-foot power cruiser printed herewith are from the board of Frederic S. Nock, of East Greenwich, R. I. This yacht is to be equipped with two 60-75-h.p. engines, and the fuel capacity will be 450 gallons. The engine room is simple and spacious and contains in addition to the engines a fuel tank, a lubricating oil tank, generating set, switchboard, locker, etc.



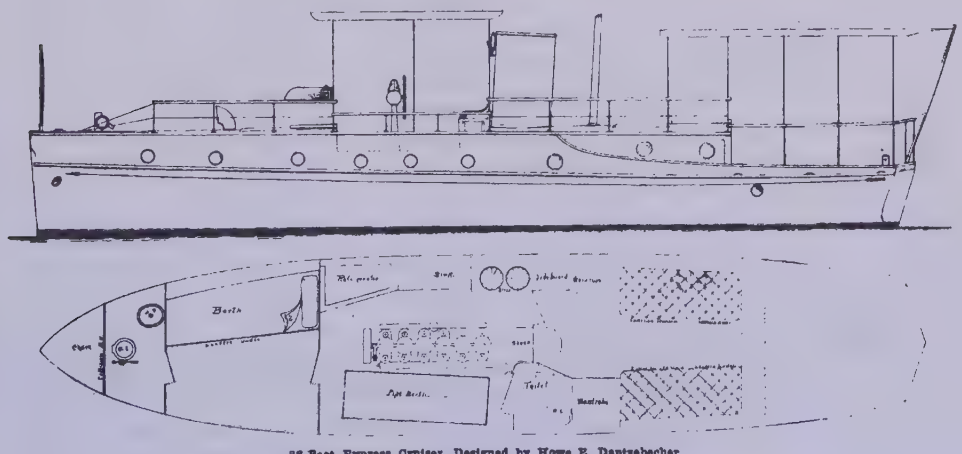
67-Foot Cruiser, Designed by Frederic S. Nock

38-Foot Express Cruiser

The designs of an attractive 38-foot power cruiser, which is to make 21 miles an hour if equipped with a six-cylinder, 5½ by 6-inch engine, have been furnished by H. E. Dantzebecher. The plans show many novel features. The raised deck is carried well aft and under this is a chain locker in the bow, a stateroom, 6 feet 6 inches long, then the engine space, 9 feet 2 inches long, with the galley on the starboard side and a pipe berth on the port side and further aft a cabin 9 feet long, fitted with two extension transoms and two wardrobes. Aft the deck is flush and from this deck a companionway leads down into the cabin.

The yacht is controlled from a sunken cockpit which is over the engine space. Aft of this is a stack for ventilating purposes. The general dimensions are:

Length	38 feet 0 inches
Breadth	7 " 9 "
Draught	2 " 9 "



38-Foot Express Cruiser, Designed by Howe E. Dantzebecher

126-Foot Fisherman

This market fisherman is being built for the Commonwealth Fisheries Company by Owen Lantz, at Essex, Mass., from designs by B. B. Crowninshield. She will make short trips (not usually exceeding eight days) between the grounds and the fish pier at South Boston.

She will carry a crew of between twenty-two to twenty-six men, eight of whom will be berthed aft in the cabin, the rest forward in the forecastle. Auxiliary power will be furnished by a 120-h.p., four-cyle, four-cylinder Nelseco Diesel engine, burning crude oil, which will give her a speed of 8 miles in smooth water. On deck will be two nests of eight dories each.

The ballast will consist of 50 tons of pig iron and a somewhat greater amount to cement boiler punchings and pebbles. She will be ready for business next July.

The general dimensions are:

Length o. a.	126	feet
Length l. w. l.	94	"
Breadth	25	"
Draught	16	"

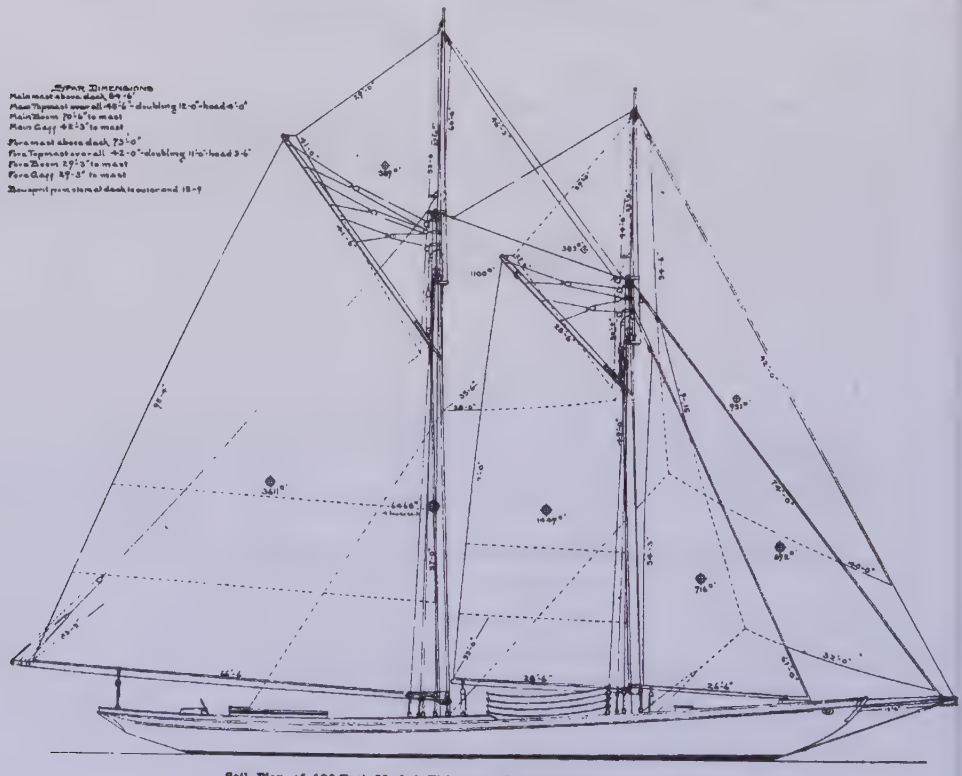
20-Foot One-Design Class

Plans have been drawn for a 20-foot l. w. l. one-design class of sloops which are very similar to the Fish Class of the Seawanhaka-Corinthian Y. C. in model. The main object was to get a short-ended, seaworthy boat, suitable for the broken water generally found on the Lower Harbor. With this in view, while the forward overhang is short, the stern is cut off square and given considerable rake, making a dory stern.

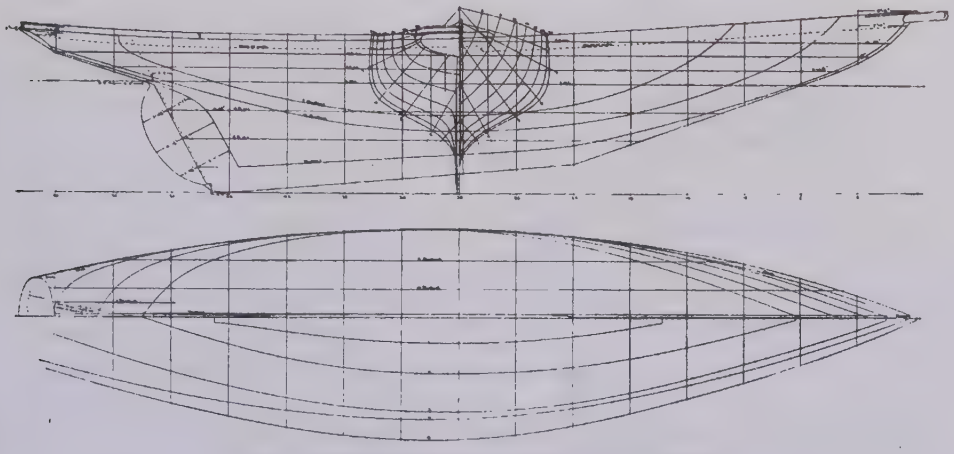
There is considerable deadrise to the sections which carried out, make fairly fine ends.

The construction is substantial, with oak frames, ⅞-inch cedar planking. The deck is of pine, canvas covered. The deck fittings are brass, blocks bronze, spars spruce, and there are 1,000 lb of either lead or iron on the keel.

In such a small boat safety is a great factor. It is almost impossible to make a watertight cockpit without making it so small as to be uncomfortable. To overcome this there is a watertight bulkhead both



Sail Plan of 126-Foot Market Fisherman, Designed by B. B. Crowninshield



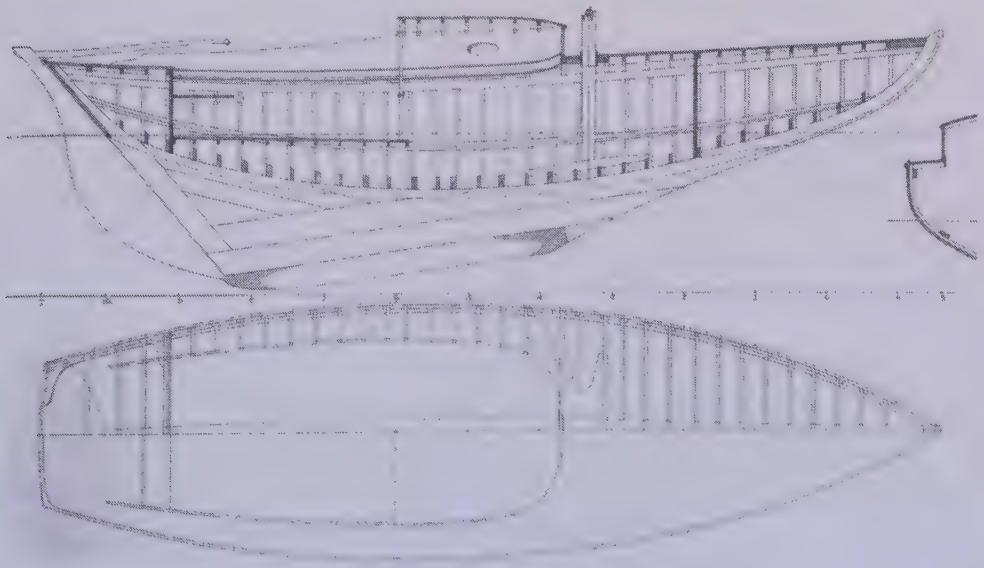
Lines of the 126-Foot Market Fisherman, Designed by B. B. Crowninshield

forward and aft, so that in case considerable water did come into the cockpit there is enough buoyancy in the ends to keep the boat afloat and give one a chance to bail out.

The sail plan is moderate, only 354.5 square feet divided with 83.23 square feet in the jib and 271.31 square feet in the mainsail. The rigging has been kept as simple as possible; in fact, simplicity is the keynote of the whole design.

The principal dimensions are:

Length o. a.....	25	feet	0	inches
L. w. l.....	20	"	0	"
Breadth, extreme	7	"	3	"
Draught, extreme ...	4	"	4	"



Construction Plan of 20-Foot W. L. One-Design Class, Designed by Fred W. Goeller, Jr.

75-Foot Cruiser for Albert Pack

Albert Pack, of East Chicago, Ind., has placed an order with the Great Lakes Boat Building Corporation for a high-speed express cruiser, 76 feet in length, which will be one of the most attractive boats on the Great Lakes. The plans of this yacht are published herewith. Experience gained by the construction of a long line of successful express cruisers has enabled the builders to assure the new owner of an unusual turn of speed—28 miles per hour—in a big able cruiser whose accommodations are laid out in a most attractive manner in point of comfort and convenience.

The hull construction is most interesting. Steam-bent frames on short centers and longitudinal seam battens form the framework, over which are applied two courses of planking. The inner skin is of cedar laid diagonally over the frames and battens. The outer course is of mahogany laid longitudinally with the plank seams centered on the battens.



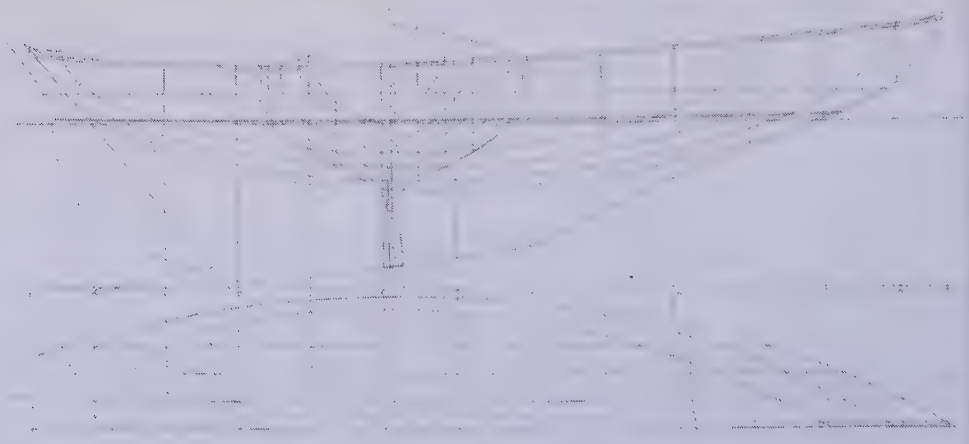
Sail Plan of 20-Foot W. L. One-Design Class

In the forecastle comfortable quarters are provided for a crew of four. Directly aft of the forecastle is an exceptionally roomy and well-arranged galley with stove, large ice-box and sink, with liberal provision for dish and provision lockers. The main saloon is a large and attractively arranged compartment, which is entered from the bridge by companionway stairs which are set inboard on an easy sweep. On either side is provided a long seat with high back, both seats and backs being upholstered over a deep box-spring construction. Sleeping accommodations are thus provided for a party of four, as the seat backs are arranged Pullman-fashion to swing up, forming upper berths. In addition to a connecting toilet, hanging lockers on either side forward and a large buffet aft are also provided.

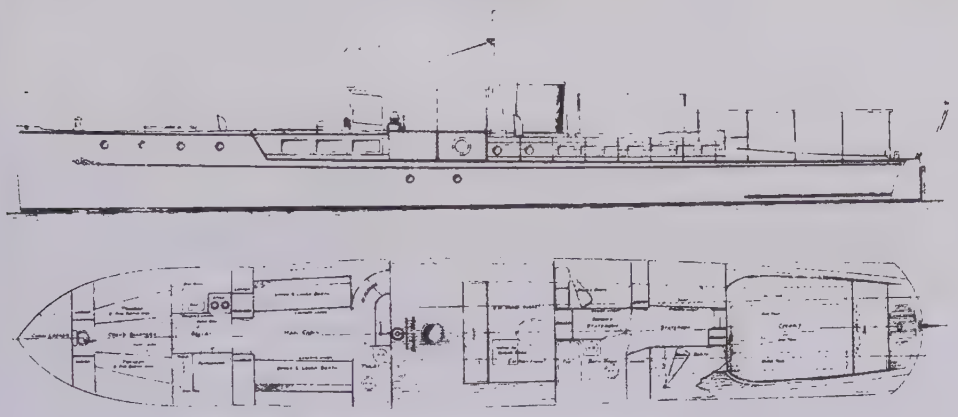
The bridge deck is 8 feet in length and extends the full width of the yacht—13 feet at this point. The bridge is made comfortable under any weather conditions by a heavily constructed awning extending well past the deck limits both forward and aft. The entire forward end is closed off by a windshield made up of heavy plate glass set in mahogany sash, which is arranged to be raised and lowered at will. The complete enclosure of the bridge is accomplished by curtains at the sides and rear. A seat upholstered in leather is built in across the entire width of the after cabin trunk, the steering column being placed on the center line forward.

The engine room is exactly amidships, full headroom being provided by extending the after cabin trunk forward over this compartment. Excellent ventilation is provided by windows, ports, large ventilators and stack.

The power plant is to consist of two eight-cylinder, 400-h.p. Duesenberg engines, made by the Loew-Victor Engine Company, Chicago. Each machine is



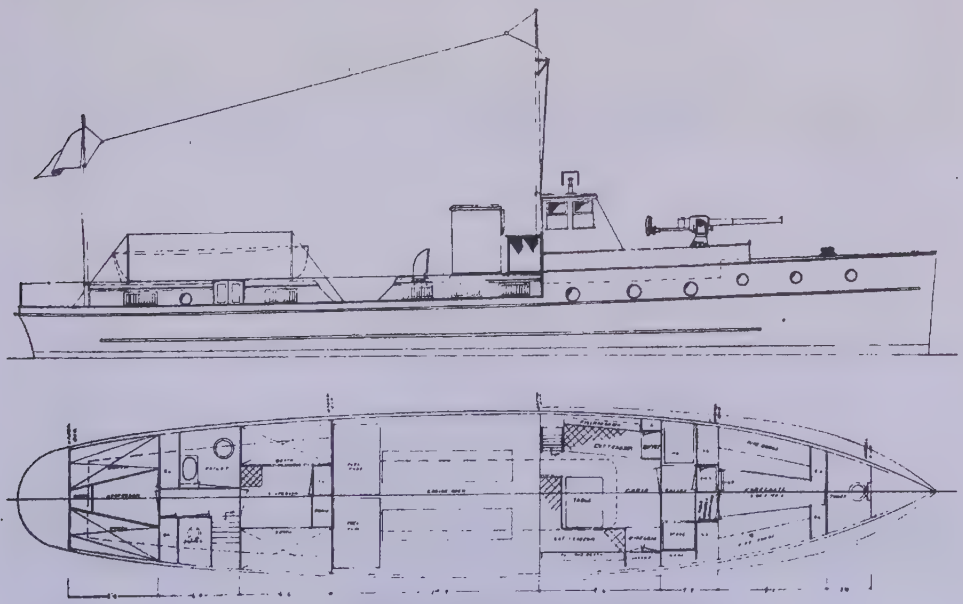
Lines of 20-Foot L. W. L. One-Design Class, Designed by Fred W. Goeller, Jr.



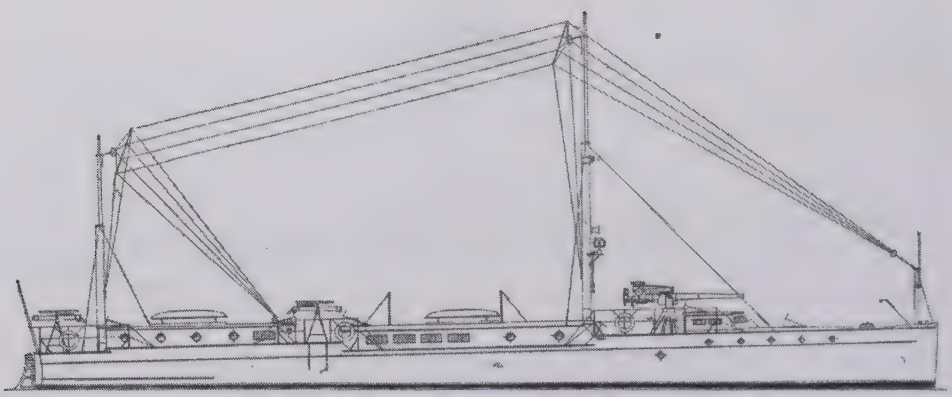
75-Foot Express Cruiser Building by the Great Lakes Boat Building Corp. for Albert Pack

equipped with such auxiliary units as electric starter, bilge, oil, air and fuel pumps, while a Matthews independent generating set will supply current for lights throughout the boat.

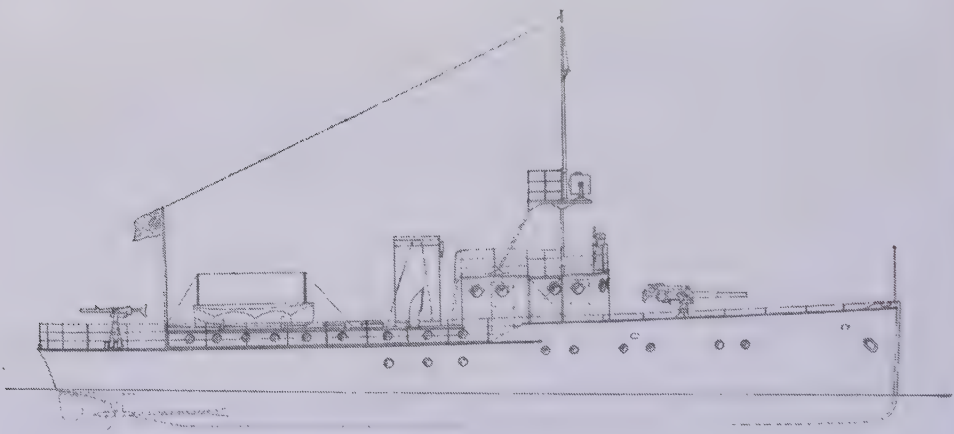
The accommodations provided aft consist of two private staterooms, both connecting directly with a bathroom. Each stateroom is provided with separate clothes lockers, dressers and drawers. The space from the cabin trunk to the stern, except for a very short after deck, is given over entirely to one large cockpit. The cockpit floor is slightly depressed below the main deck level, the space beneath housing the fuel and water supply tanks, the total capacity of the fuel tanks being 1,200 gallons. Aside from the wide leather-cushioned seat across the after end of the cockpit, it is left entirely clear for the use of chairs.

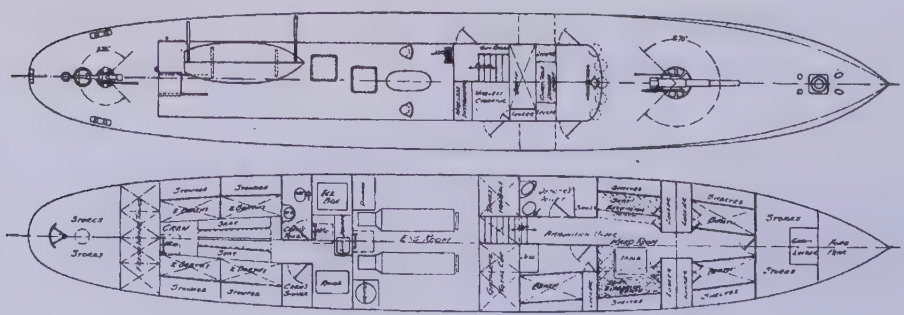


67-Foot Water-Line Patrol Boat, Designed by Swasey, Raymond & Page

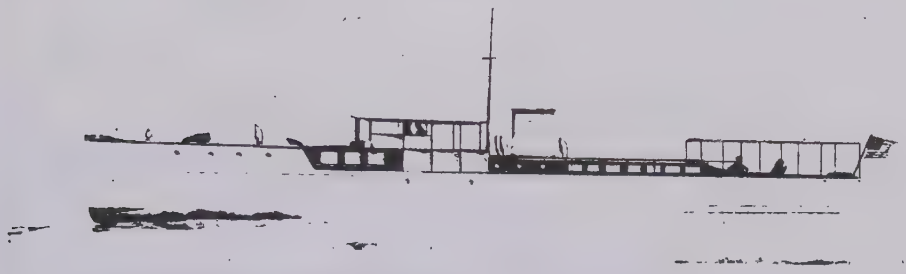


75-Foot High-Speed Patrol Boat, Designed by Elliot Noel Burwell





The Crouch-Nutting 85-Foot Patrol Boat



Gretchen, 75-Foot Express Cruiser Building by the Great Lakes Boat Building Corporation for Albert Pack

Three Types of Patrol Boats

Three designs of patrol boats are given herewith. Just now much attention is being devoted to this type of power boat because of the energetic preparedness movement and because the U. S. Navy Department is asking for suggestions of types from the different designers.

These three are a 67-foot vessel, designed by Swasey, Raymond & Page; a 75-footer, designed by Elliot N. Burwell, of Boston, and an 85-footer, designed by George F. Crouch and Wm. Washburn Nutting, which is printed herewith by consent of *Motor Boat*.

The plans tell their own stories. The 67-footer shows a vessel strong enough to mount a rapid-fire gun on a raised deck which is over the main cabin forward.

Aft of the gun is a protected pilothouse. The engine space is amidships and the tanks are in the engine compartment. The breadth is 13 feet 6 inches.

The forecastle has pipe berths for two or four men. There is then a watertight steel bulkhead and aft of this is the galley, then comes the cabin, which has extension transoms on each side, a wireless outfit in one corner and a buffet on the opposite side. Aft of the engine space are two double staterooms, separated by a toilet on the port side and a shower bath on the starboard side. This vessel is fitted with a signal mast just forward of the stack and is equipped with wireless.

The 75-footer mounts a 3-pounder forward and machine guns amidships and aft. An anti-air-craft gun can be installed in place of one machine gun. The extreme breadth of this vessel is 13 feet and her extreme draught 4 feet. With all stores on board it should make 32 knots, with three engines of 400 h.p. each. The hull is divided into seven watertight compartments with six steel bulkheads.

The Crouch-Nutting vessel is 85 feet long over all, 83 feet on the water-line, 13 feet 6 inches breadth, draught amidships 3 feet 3 inches, extreme draught 4 feet; total gasolene capacity, 1,400 gallons. The armament consists of one 3-inch gun, one semi-automatic one-pounder and one machine gun. The speed, according to the power installed, will vary from 18½ to 21½ knots and the cruising radius at reduced speed from 1,000 to 1,500 nautical miles and at full speed from 300 to 370 nautical miles.



Frances III, 65-Foot Power Cruiser Building for E. M. Jennings, of Bridgeport, by the New York Yacht, Launch & Engine Co. 65 Ft. Long, 14 Ft. Breadth. Driven by a 6-Cyl. 65-75-H.P. 20th Century Engine

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART IV

IN this part I will explain the meaning of *stability* and one method of calculating a boat's stability.

The term stability when applied to a boat, or vessel, means the *moment of force,* expressed in foot-pounds, or foot-tons, by which the boat, or vessel endeavors to right itself when inclined to a named angle from the upright by some external force. This moment is the product of *weight* × *leverage;* the weight being the actual weight of boat, or vessel, ascertained by making the displacement and weight calculations explained in Parts II and III, and leverage being the distance between the lines of action of the upsetting and righting forces, ascertained by making calculations.

Before proceeding further I will call your attention to this important fact: The weight being the weight of boat and all on board at time of inclination remains the same regardless of whether boat is floating upright, or is inclined to any angle, or in any direction; but the leverage, as it depends upon *form* of the underwater body of boat, will vary because the immersed *form,* or shape, changes with EACH change in inclination. The following brief explanation of the meaning of terms used in this lesson will prove a help when you read my explanation of stability.

Statical Stability means the amount of force by which a boat tries to regain its upright position after having been deflected from it.

Dynamical Stability means the amount of work done to deflect boat from the upright (its original position).

Transverse Stability means stability when inclined transversely, or to one side.

Longitudinal Stability means stability when inclined longitudinally, or lengthways.

Stable Equilibrium.—A boat is said to be in stable equilibrium, or stable, for a named direction and angle of inclination if, on being inclined in that direction and to the named angle it tends to return to the original position of rest when the inclining pressure is removed.

Unstable Equilibrium.—A boat is said to be in unstable equilibrium, or unstable, for a named direction and angle of inclination if, on being inclined in that direction and to the named angle it tends to move further than the desired angle and will not return to the original position of rest when the inclining pressure is removed.

Neutral Equilibrium.—A boat is said to be in neutral equilibrium for a named direction and angle of inclination if, on being inclined in that direction and to the named angle it remains there and neither moves further away or returns to the original position of rest when the inclining pressure is removed.

EXPLANATION OF STABILITY

I will begin by reminding you that stability calculations, like all other boat calculations, are made before the boat is built and for the purpose of ascertaining these three things:

1st.—Whether the boat will be stable and safe under all ordinary service conditions.

2d.—The amount of stability the boat will have at various angles of inclination from the upright (rest) position.

3d.—The range of stability, or inclinations between which it will be absolutely safe.

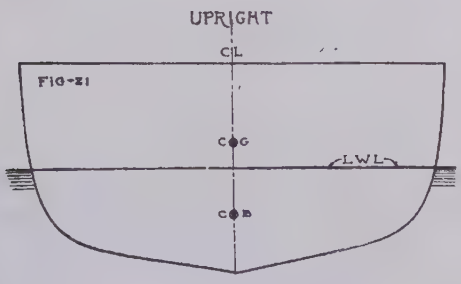
Therefore, it is assumed in the following explanations that it is desired to ascertain the three things mentioned above and that the calculations are being made from measurements taken from a set of boat drawings. When calculating stability it is always assumed that boat is afloat in still water.

Stability of a Boat on Land.—A boat supported on land is acted upon by gravity alone, the downward pull of which is always equal to the total weight of boat, and the location of the C.G. point relative to the point of support determines whether the boat will remain upright or topple over.

Stability of a Boat When Afloat.—But when a boat is afloat in still water the downward pull, which I will now call pressure, continues to act in the same manner that it acted on land, but as the portion (bulk) of boat immersed in water now receives support from the surrounding water, a new force, the upward support of the water, has to be considered and it is the location of the center of this upward support (called *center of buoyancy*) relative to the center of the boat's weight (called *center of gravity*) that determines the boat's stability when upright and when inclined in *any direction.*

The words *any direction* need some explanation. A boat afloat can incline transversely, longitudinally, and in any direction between these two, and while the force necessary to incline a boat to a named angle will vary with *direction* of inclination, it is an assured fact that the greatest force is required for *direct* longitudinal inclinations and the least for *direct* transverse. In addition to this, it is also an established fact that all boats of ordinary form are perfectly stable longitudinally for any angle they will move to when in service. These things being established, the designer desiring to ascertain the three things mentioned above need only calculate the force with which the boat will endeavor to right itself when inclined in the direction of least stability—*transversely*—because for inclinations in all other directions the stability *must* be greater than the minimum, or transverse. Therefore, it is sufficient to determine stability for several direct transverse inclinations, and for one selected longitudinal inclination.

From the above you will understand that transverse inclinations are the most important ones to consider. I

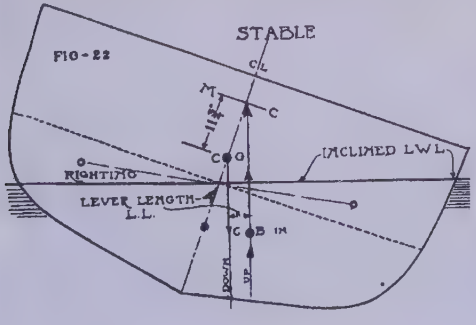


will, therefore, make my explanations and illustrations for transverse inclinations, except in cases when otherwise stated.

I will now resume my remarks about stability. When a boat is afloat in an upright position the up pressure of water on the immersed portion of hull centers at the C.B. point, and the down pressure of the boat's weight centers at the C.G. point, and as the two forces (pressures) are alike and equally proportioned each side of center line of boat, they must act upwards and downwards along the same vertical line and continue to do so just as long as the boat is not forced out of her upright position. Fig. 21 shows largest cross-section of a power boat and on it I have indicated the vertical positions of the C.B. and C.G. points, and the line along which the up and down pressures act.

Now let us assume that an external force has inclined the boat to position shown in Fig. 22 illustration.

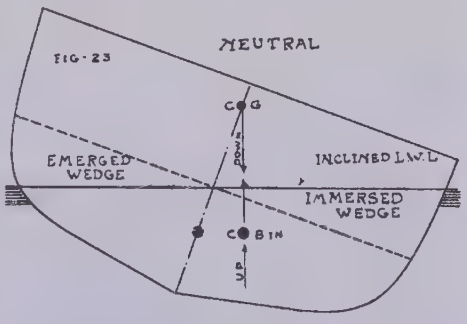
Just as soon as this happens a portion of boat immediately above the water level, on side furthest from the pressure, becomes immersed and an *equal-sized* portion on side the pressure is exerted lifts out of (emerges from) the water, and this movement, as you can readily see by referring to Fig. 22, has made the form of immersed body different from that immersed when boat was upright, and has caused the center of up buoyancy pressure (C.B.) to move from its original central position towards the side furthest from the inclining pressure, because the C.B. point will always be at the exact center of the bulk immersed in water. This movement of the C.B. point has caused the up pressure of buoyancy to act along a vertical line that is some distance out from the center line of boat, and as no weight has been moved by the inclination the C.G. of weight has not moved and



the C.G. down pressure must continue to act along a vertical drawn downwards through the C.G. point located above the center line of keel. Under these conditions the up force of buoyancy and the down force of gravity are opposing forces that act along different lines; one trying to force the boat down and the other to buoy it up, and if the up force of buoyancy, measured by its weight and leverage, is greater than the down force of gravity, measured by its weight and leverage, the boat will be stable and will immediately return to the upright when the inclining pressure is removed.

The weight used for the calculation is always the actual weight of boat and all on board, the buoyancy force is always exactly the same as the weight, and the leverage is the distance the lines of action are away from the center line of boat; though in practice the calculations are simplified by making the lever length the distance the lines of action are apart. Of course you understand that the lines of action of the two forces are always along verticals drawn through the centers.

I said above that the calculation is simplified by making the lever length the distance between the lines of action; I will explain this. When calculating the moment of opposing forces in the usual manner, the moment of



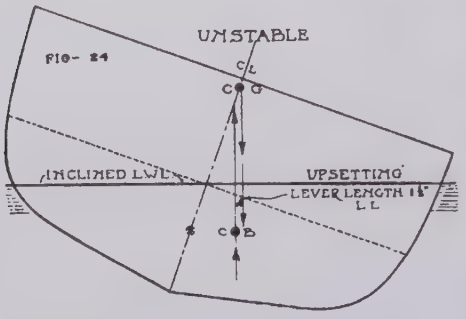
each force is calculated, then the lesser is deducted from the greater and the remainder is the moment of the greater force.

In cases when the weights are alike and act along lines that are parallel and lie in the same direction from weight, the work is greatly simplified and similar results are obtained by measuring the distance between the lines of action and multiplying this measure by the weight. The figures obtained by making this short calculation will be the moment in favor of the force that acts along the line furthest out from weight.

On Fig. 22 the up force of buoyancy is furthest out from center line and therefore that illustration shows a condition of stability, and if the weight (displacement) of boat is 7,723 lb. and the measured distance between verticals is 4 inches, the moment of force tending to return boat to an upright position when the inclining force is removed is 2,574 *foot-pounds*.

$$7{,}723 \times 0.33 = 2.574 \text{ foot-pounds.}$$

You may wonder, when looking at the Fig. 22 illustration, how it can happen that, after the C.B. point has moved some distance out from center line and the C.G. point does not move, a condition can arise in which the down C.G. vertical can fall further out from the center



line than the up C.B. force vertical. I will explain this by means of illustrations, Fig. 23 and Fig. 24.

Fig. 23 shows the same inclination and cross-section as Fig. 22, and the weight of boat and location of C.B. inclined position is the same; but I will suppose that, owing to placing engine and some of the weights a greater distance above keel, the vertical height of C.G. point is raised to the point marked C.G. on Fig. 23. You will note that with C.G. point at that height above keel the down pressure of weight again acts along the same vertical that the up buoyancy pressure acts, and under such conditions the boat is neutrally stable and will neither move further from, or back to, upright when the inclining pressure is removed.

Now I will complete the explanations by illustrating a condition of instability.

Fig. 24 illustration shows a condition of instability and if you will examine that illustration and compare it with Fig. 23, you will see the C.G. point is raised to a higher point than is shown on that illustration, and now the down vertical of C.G. action falls further out from the center line of boat than the up buoyancy pressure. Under these conditions the moment of force is an upsetting one equal to the distance between the lines of action multiplied by the weight, or 965.37 foot-pounds.

$$7{,}723 \times 0.125 = 965.37 \text{ foot-pounds.}$$

And the boat will move further from the upright, or until the moments of up and down forces again balance.

What do these illustrations teach? They teach two things.

1st.—That with C.B. height remaining stationary the higher the C.G. point is raised above keel of boat the smaller the righting moment will be.

2d.—That there must be, for every inclination, a point along the center line of every boat above which it is unsafe to raise the C.G., and if the C.G. is kept below this point the moment of force will be a righting one, and if located above it the moment will be an upsetting one.

And it can also be said that if it were possible to locate on the center line the height to which the C.G. can be raised without boat becoming unstable, a designer would have a means for ascertaining whether a boat is stable or unstable, and its approximate stability or instability.

Now it happens that it is possible to determine very accurately and quickly the location above which it is unsafe to raise the C.G. point and having located it the moment of stability can be ascertained, very closely, by making a simple and short calculation.

I will explain the way to determine both of these things.

Determining the Point on Center Line Above Which It is Unsafe to Raise the C.G. Point

This point, which is termed the *metacenter,* (usually written M.C. or M.) can be accurately located for small inclinations from upright by simply extending the C.B. inclined line up to center line of boat. The point of intersection of the two lines will be the M.C. point. And having marked this point, if it is desired to find out the lever length, measure the distance, along center line, that C.G. is from the M.C. point and multiply by the *sine of the angle of inclination.*

To illustrate the application of this formula I will make use of Fig. 22 and having located the M.C. point, I will calculate the lever length and righting moment.

By continuing the C.B. inclined line upwards to center line I find that it intersects at a point that is 11¼ inches (0.979 foot) above the C.G. point (see mark M.C. and measurement on Fig. 22). The angle of inclination is 20°, and the sine of 20° is .3420, therefore the righting lever length at 20° is

$$0.979 \times .3420 = 0.3348 \text{ foot.}$$

And knowing the lever length, the righting moment can be ascertained by making the calculation: Weight × Lever = Moment of force.

$$7{,}723 \times 0.3348 = 2{,}580 \text{ foot-pounds.}$$

These figures are very close to the ones obtained by making the Fig. 22 calculation.

You must, however, bear in mind that this method of calculating stability is only accurate for inclinations *at which the point of intersection of the center of inclined and upright water-lines is at the center line of boat,* or only at small inclinations.

Here is another detail that needs explaining.

Explaining Why the Point of Intersection of the Inclined and Upright Water-Lines Cannot Always be at the Center of Boat

On Fig. 22, 23, 24 illustrations I marked the inclined water-line full and upright water-line dotted, and you will note that the two lines cross, or intersect, at the center line of boat. But this condition can only exist so long as the volume of the wedge-shaped portion on immersed side, measured *from center line* out and included within the inclined and level water-lines, and portion of outline of hull between them, happens to be *exactly* the same as the volume of the wedge-shaped portion that is enclosed by the same lines on the emerged side. When this condition does not exist (for boats of ordinary form

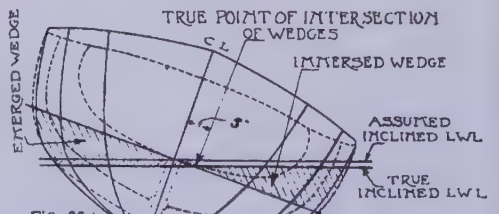


FIG.-25

it can only exist at very slight inclinations) the point of intersection of the wedges *must* be at a sufficient distance from the center line of boat to *equalize* the volume of wedges. The reason for this is: It is absolutely impossible for the VOLUME immersed in water to alter by inclination, therefore the immersed volume *must* be exactly the same when inclined as it is when boat is upright.

Now turn to the Fig. 25 illustration. On that illustration is shown full width cross-sections, fore body in full, after body in dotted lines, of the Fig. 14, 17 boat inclined transversely to an angle (20°) at which the points of the wedges *will not* intersect at center line. You will note that I have marked the upright L.W.L. and an *assumed* inclined L.W.L. that crosses the upright l.w.l. at the center line of boat.

But if you carefully examine the wedge-shaped portions enclosed by these lines and the outline of boat sections between them, you will clearly perceive that with the inclined L.W.L. at the assumed location the volume of wedge-shaped portion immersed by the inclination is greater than the volume enclosed by the same lines on the opposite of boat, it, therefore, is apparent that the boat *cannot* float to the assumed L.W.L. position; and as the wedge enclosed by the lines on immersed side is of greater volume than the wedge enclosed by the lines on emerged side the boat *must* rise out of water until wedge volumes are equalized. The angle of inclination cannot change, therefore the boat lifts bodily out of water and by doing this the point of intersection of wedges is moved a distance towards the wedge of greater volume—the immersed wedge in this case. On the illustration I have drawn the *true* inclined L.W.L., and if you will compare the immersed and emerged wedge volumes enclosed between that line, the level L.W.L. and the section bounding lines, you readily see that the wedge volumes have been equalized by the up movement of boat.

What really has taken place is a transfer of the excess volume of the larger wedge from its side to the opposite side of boat.

On the illustration I show the excess volume of immersed (the larger) wedge blank and transferred to the opposite (emerged) wedge and you will note that by making this transfer the point of intersection of the two wedges moves from the center line to a point that is 5 inches from it.

If a boat has a greatest cross-section shaped like Fig. 22, this lifting out of water will not begin until about 15° of inclination and will be very slight indeed for inclinations up to about 20°; but if the greatest cross-section is shaped like Fig. 25 the lifting out will begin at an inclination of about 10° and will be so great at 20° that the point of intersection of wedges will have moved some distance from the center line of boat, as you can note by examining Fig. 25. In the majority of power boats of ordinary form, the lifting out will not begin under 10° of inclination, so it is always safe to assume that the point of intersection of the wedges in such boats will coincide with center line up to inclinations of 10 or 12°.

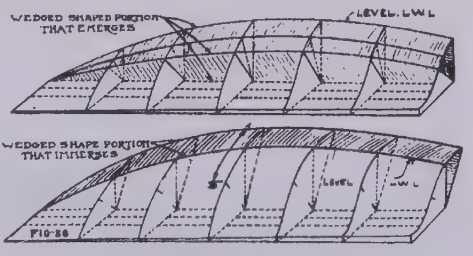
I will now resume my remarks about stability.

So long as there is a leverage the boat, if left free to move, will not remain at rest, or as it is termed, be in a state of equilibrium; and the longer the lever, or greater the distance between the lines of action, is the greater will be the moment of force tending to either bring the boat back to upright, or capsize her, as the case may be.

Changes in distance between C.G. and M.C. points produce corresponding changes in the stability of a boat; in fact, stability can be said to vary with the distance, which is usually called *metacentric height.*

The vertical position of the C.G. always depends upon the vertical distribution of weights—construction, ballast, equipment, cargo, etc.—and in boats that do not carry movable ballast, or cargo, such as power boats used for pleasure purposes, the vertical height of the C.G. can be said to be permanently fixed and that no alteration in its position can be made without adding to or taking away weight and thus reducing or increasing displacement. So in such boats it can be said that the *metacentric height* depends almost entirely upon the *form* of boat in water and of that portion that will become immersed and exposed as boat inclines, and it is here that the designer should try to obtain the quality which makes a boat stable and safe under all conditions. It is very important to remember that the wedge-shaped portions immediately above and below the level L.W.L. are included in the part of boat that has an influence upon *metacentric height.*

That this should be so is very evident, and if you will study the Fig. 25 and 26 illustrations I am sure



you will have no difficulty in understanding that whenever a boat inclines from the upright a certain portion of the abovewater body becomes immersed and another equal-sized portion on opposite side emerges from the water, and if the shape of these portions is such that the act of immersing the abovewater portion and lifting the underwater portion out of the water will add to the power of boat to resist the inclining force, the *moment* of stability *must* increase with each increase of inclination; but if, on the other hand, these portions are shaped so that in place of adding to the resisting power they detract from it, then the moment of stability will decrease with each increase of inclination and the boat will quickly become unstable.

The names given to the portions of a boat that become immersed and emerge from the water when a boat is inclined are the *wedges* of *immersion* and *emersion;* and while the size of these wedges will vary with each change in inclination, they can be accurately described as the parts of a boat which being under water when she inclines one way are lifted out of water when she inclines in an opposite direction. Fig. 25 shows cross-section view, and Fig. 26 longitudinal view of wedges of immersion and emersion of the Fig. 14 boat when inclined to 20° from upright. To avoid confusing you I have omitted from the Fig. 26 illustration the portion of boat that is above the wedge of immersion and have

shown each wedge separately. The two wedges combined reach from *A* to *B* on both sides of hull.

I will now conclude my remarks about metacentric height. It does not follow that because the M.C. height is ample when a boat is upright, or inclined to a slight degree, it will be ample when boat is subjected to excessive inclining force; nor does it always follow that a boat having a small M.C. height when upright will be unsafe at greater inclinations.

For example, one boat may have an M.C. height of 2 feet when upright and ample righting lever length at small angles of inclination, but as it heels, owing to the form of boat, the righting lever may get shorter and shorter and vanish altogether before an angle to which the boat is liable to incline under ordinary service conditions is reached.

Another boat may have little, or no, M.C. height when upright, or righting lever at small inclinations, but as the inclination increases the righting lever may lengthen and the range of stability become greater than necessary. Therefore, don't jump to the conclusion that good M.C. height when upright or at slight inclinations will *always* produce satisfactory stability conditions.

A moderate M.C. height when upright, a moderate length of righting lever at small inclinations with gradual increase in lever length as inclinations increase, and a good range of stability are the most desirable conditions; and these can best be obtained by a wise design of the underwater and wedge portions of hull combined with a proper disposition of weights vertically.

Below I give particulars of M.C. heights at 10° inclinations of a few power boats that have proved amply stable under all conditions of service.

The heights given are for *direct* transverse inclination to 10°; but please remember that just as stability varies with each change in direction and angle of inclination so the M.C. height will change, being lowest when inclinations are directly transverse and highest when they are directly longitudinal.

TABULATED LIST OF DIMENSIONS AND TRANSVERSE M.C. HEIGHTS

Length Feet	Br'th Ex. Feet	Depth Keel to Deck Feet	Dra't of Water Feet	Disp't in Tons	C. G. above Keel Feet	M. C Height Feet	Ballast Carried Lb.	Type of Boat
30	7	4.0	2.5	3¼	1.95	1.8	none	Open power
36	9	5.0	2.9	6¼	3.3	2.5	none	Open power
40	9	6.5	3.3	9	3.0	1.65	none	Open power
45	10	6.6	3.0	10	3.0	2.0	2000	Power cruiser
50	11	7.0	3.6	13	3.5	1.7	1000	Power cruiser
75	13	7.0	3.6	30	4.2	1.7	none	Power cruiser
85	16	10.0	6.0	70	6.0	2.5	tons 10	Power cruiser

As the inclined C.B. position must be known before it is possible to calculate a boat's transverse stability at any named inclination, it is evident that the underwater *inclined* body, at the named inclination, must be measured and its exact center point, transversely, determined. *In cases when the point of intersection of the two wedges is located at the center line of boat* it is a very simple matter to determine the inclined C.B. position when once the upright C.B. position is known; because it is a well-known principle of mechanics that if a known portion of a known volume, whose center point is known, is shifted a known distance, the effect this shift will have can be quickly ascertained by multiplying the volume of portion shifted by the distance its center point has shifted and dividing result by the whole volume figures. The quotient will be the distance the whole volume center point has moved and the movement will be along a line that is parallel with the line of movement of shifted portion.

To illustrate the application of this simple rule, I have made use of Fig. 22, and for the purpose of this calculation have assumed that the volume of immersed wedge is 14.277 cubic feet, and that the center point of wedge is located 1.5 foot out from center line.

We know that the point of intersection of the wedges is at the center line of boat, therefore the emerged wedge has same volume as the immersed, and we will assume that its center point is the same distance out from center line; and as by inclining the volume of wedge that emerges is transferred from under water on the emerged side to under water on the immersed side, the distance the known volume (14.277 cubic feet) is moved is 3 feet (the distance between wedge center points).

Therefore the figures for the calculation are:

Known displacement, 60.339 cubic feet (7,723 lb).

Known volume of wedge that is moved from one side to the other, 14.277 cubic feet.

Known distance between center points of movement, 3 feet.

And the calculation is:

$$\frac{14.277 \times 3}{60.339} = 0.7098 \text{ foot (8 inches)}$$

And the movement will be along a line drawn parallel with a line drawn from center point of one wedge to center point of the other (the dash line on illustration), or from C.B. point when upright to the C.B. inclined point, which is a distance of 8 inches along a line drawn parallel with the dash line.

To determine the C.B. inclined position at inclinations at which the point of intersection of wedges has moved out from center line, an entirely different calculation must be made, because it is necessary, in cases like this, to determine the distance boat will lift out of water before the transverse movement of C.B. point can be calculated.

There are several ways to calculate this tranverse movement of C.B. at high angles of inclination. One is to mark a water-line at the desired inclination and at a point that you *think* will make the inclined displacement the same as the upright (remember I am referring to inclination at which the point of intersection of wedges will be *away* from the center line of boat); and then to remeasure the entire inclined underwater body and determine the center point transversely.

Another method is to measure the wedges separately, calculate their moment of transference and the corrected L.W.L., and then from these figures determine the C.B. movement in a somewhat similar manner to the one I have explained.

Another method, and a good one, is the *mechanical* one fully explained in my boatbuilding article in the November (1916) issue of THE RUDDER.* And another is the combination method, by which the moment of transference of wedge volumes, the inclined corrected water-line, the lever length and moment of stability are all calculated at one time by making a set of preliminary and combined calculations.

The last-mentioned method is not difficult to understand, and the calculations being modifications of the *Simpson's* and moment calculations already explained,

*I suggest that you read and study the explanation referred to.

can be made by anyone having a knowledge of those rules and the ability to do simple problems of arithmetic; so I have selected it and I will explain the calculations fully and illustrate my explanations by working out a complete set of transverse stability calculations from the lines of the Fig. 14 boat; but before doing this I will complete my explanation of stability.

I mentioned *range* of stability. By range of stability is meant the number of degrees to which a boat can be inclined from upright without becoming unsafe. The range of stability of every boat should be sufficient to insure a *safe* length of righting lever at the greatest angle that boat is likely to be inclined to when in the service she is designed for.

Small power boats designed for protected waters should have a range of stability of at least 50°, and for large cruisers the range should not be less than 70°.

The principal things that influence *range* of stability and lever length are:

1st.—*Form*, both below and immediately above the L.W.L. especially the portion of hull that is included in the wedges of immersion and emersion when boat is inclined to angles within the desired range of stability.

2d.—The *vertical* position of the C.G. point. Both range of stability and length of lever is lessened with each rise in the C.G. position.

3d.—Increase of displacement, and draught of water, may not add to range of stability and actual length of lever but *will generally* add to *righting moment*; because righting moment is the product of *weight* × *lever*.

4th.—Increase of *beam* (breadth) will add to both range and lever length even in cases when displacement and draught remain the same.

5th.—An increase of freeboard, especially if boat's deck will become immersed before reaching the limit of range of stability, will add greatly to the range and also to the lever lengths at inclinations above those when deck, with lower freeboard, would become immersed.

A Few Remarks About Longitudinal Stability

Up to this I have considered transverse stability only, but inasmuch as a boat can incline longitudinally as well as transversely, it is necessary to know a little about longitudinal stability and the calculations made to determine it.

Stability is always at a minimum for transverse inclinations and at a maximum for longitudinal ones, and the difference between minimum and maximum is very great indeed; so great, in fact, that a designer knows without making any calculations that longitudinal stability at *all* inclinations is many times greater than necessary. It is, therefore, unnecessary to make detailed longitudinal stability calculations; all that is necessary being to determine the longitudinal M.C. height for one slight inclination—say, 8 or 10°.

Every boat has a longitudinal M.C. point which indicates the height to which the C.G. of weight can be raised without the boat becoming unstable *longitudinally*, and the position of this point is found in identically the same manner that the transverse M.C. point location is found, except that the *longitudinal* movement of the C.B. is ascertained and the line drawn upwards from the inclined longitudinal C.B. point to the point where it crosses a vertical drawn upwards from the longitudinal C.G. point. Later I will give a short and accurate formula for determining the exact longitudinal M.C. height.

I will now give in concise form a few definitions and explanations:

Stiffness.—A "stiff" boat is one that is very hard to incline and when inclined and the inclining pressure is removed it will come back to upright very suddenly. Excessive stiffness is not a desirable feature, because it causes excessive strains on a hull. Stiffness is caused by a boat having a large transverse M.C. height. The remedy is to lower it by raising the C.G.

Tenderness.—A "tender" boat is one easily inclined. It is due to the M.C. height being too small and the remedy is to lower the C.G. point.

Steadiness, when applied to a boat, means a tendency to incline slowly and return to upright without undue shock, or strain. It is obtained by giving a boat a moderate and proper M.C. height.

Oscillation is a term used to express the rolling motion of a boat. By oscillation is meant a complete roll from port to starboard, and the time occupied in making this oscillation is termed the *period* of oscillation. Great stiffness creates *rapid* oscillations, while tenderness conduces to slow ones.

A slow rolling motion can be obtained in three ways.

1st.—By giving a boat a small M.C. height.

2d.—By placing resistance agents outside of hull, such as bilge keels.

3d.—By stowing weights, or ballast, well out from the center line of boat.

In the next part I will give the complete illustration stability calculations and I will explain the power and resistance calculations.

(To be Continued)



Happenings in the Yacht Clubs

Corinthian Y. C., Philadelphia

THE newly elected officers of the Corinthian Y. C., of Philadelphia, are: Commodore, Charles Longstreth; vice-commodore, Judge J. Willis Martin; rear-commodore, Frank B. Bower; secretary-treasurer, Addison F. Bancroft; measurer, Charles D. Mower; race committee, A. F. Bancroft, G. Herbert Millet, Enoch S. Farson; trustees, George E. Bartol, J. Norman Henry.

Atlantic Y. C.

Commodore Edgar F. Luckenbach is now senior flag officer of the Atlantic Y. C. He was elected with the following officers at the annual meeting held recently: Vice-commodore, R. Lawrence Smith; rear-commodore, Edmund Lang; secretary, E. I. Graff; treasurer, P. H. Hart; trustees, Frederick R. Thorns, Charles I. McLaughlin; membership committee, Arthur L. Doremus, chairman; Kenneth Lord, Horace E. Boucher; nominating committee, Horace E. Boucher, chairman; Gherardi Davis, Ferdinand S. Crosley, Robert A. Brown, Albert H. Bickmore, Frederick R. Thorns.

Park City Y. C.

Commodore Frank Y. Mills has been unanimously reelected senior flag officer of the Park City Y. C., of Bridgeport, Conn. The other officers are: Vice-commodore, D. L. Boyle; rear-commodore, S. E. Hall; secretary, E. D. Parker; treasurer, H. C. Gould; board of governors, A. B. Way, George Derben. A Summer station is to be built at Long Beach on property having a frontage of 100 feet on Long Island Sound and a depth of 500 feet, which extends across the island to Lewis Gut, thus giving water facilities on both sides of the station. A clubhouse, 70 by 50 feet, is to be built.

Knickerbocker Y. C.

At the annual meeting of the Knickerbocker Y. C., held at the Hotel Imperial, New York, Wednesday, February 21st, the following officers were elected to serve the ensuing year: Commodore, Daniel Noble; vice-commodore, Louis M. Taylor; rear-commodore, Fred. L. Kraemer; treasurer, G. H. Cooper; secretary, J. O. Sinkinson; measurer, G. G. Davis; fleet surgeon, W. H. Peer, M.D.; board of directors, Rodman Sands, W. F. Buhl, Harry Stephenson, R. H. Crawford, H. L. Curry.

Raritan Y. C.

The Raritan Y. C., of Perth Amboy, N. J., has elected these officers: Commodore, Peter C. Olsen; vice-commodore, Louis Compton; treasurer, Willard Brunner; secretary, William H. Fraser; fleet captain, J. W. Barwell.

Bergen Beach Y. C.

Harry J. Hildebrand, who has been commodore of the Bergen Beach Y. C. for three years, has retired and been succeeded by Commodore J. C. Snackenberg. The other officers elected at the annual meeting recently are: Vice-commodore, George L. Ford; rear-commodore, J. E. Burns; treasurer, F. L. Hough, Jr.; financial secretary, Harry W. Kiersted; recording secretary, Frederick C. Haab, Jr.; measurer, J. A. Lindstrom; directors (two years), H. J. Hildebrand, Daniel Riordan; director (one year), John A. Sill.

Bay Ridge Y. C.

At the annual meeting of the Bay Ridge Y. C., held in the clubhouse at the foot of 58th Street, Brooklyn, the following officers were elected: Commodore, William Banks; vice-commodore, Arthur Nyland; rear-commodore, Edward Hughes; secretary, John Reynolds; treasurer, William King; financial secretary, John Lendrum; measurer, Harry Harding; fleet captain, Joseph E. Johnson; trustees, William King, John Reynolds, Joseph Holsman; regatta committee, Robert Gorman, Andrew Steele, Peter Wilson; house committee, Michael Sturn, William Harding, Joseph E. Johnson; membership committee, Joseph Lendrum, John Thorsen, William Ulrich; entertainment committee, Arthur Lovig, Harry Harding, Thomas Daly.

Mosquito Fleet of Boston

The following officers and committees have been elected by the members of the Mosquito Fleet of Boston: Commodore, M. E. Wilson; vice-commodore, W. M. Mutz; fleet captain, A. C. McLain; secretary, D. G. Gallagher; treasurer, C. J. Driscoll; measurer, E. T. Landers; fleet surgeon, A. Dalrymple, M.D.; directors, James H. White, J. F Leamy, E. L. Hopkins; house committee, John Shaw, C. E. Levis, J. J. Cusick, P. L. Leonard, T. F. Ryan; regatta committee, C. J. Higgins, H. A. Dalrymple, W. C. Cherrington, W. Alder, T. Seport; membership committee, R. S. Landers, J. Griffin, H. S. Small, R. C. Winslow, Louis George.

Philadelphia Y. C.

The following officers were elected to serve for the ensuing year in the Philadelphia Y. C.: Commodore, Philip H. Johnson; vice-commodore, J. Fred Betz, 3d; rear-commodore, Robert J. Williams; recording secretary, S. W. Bookhammer; measurer, Thos. F. Durham; fleet surgeon, Dr. T. Lewis Adams; harbor master, Thos. W. Boyd; trustees, Geo. W. Fite, Otto Robt. Heiligman, S. B. S. Barth, Thos. F. Durham, Wm. A. Christy, Ed. K. Nelson, Arthur Bloch.

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Praise from a Sky Pilot

Editor of THE RUDDER:

I take pleasure in handing you herewith my check to cover subscription to THE RUDDER for the ensuing twelve months and wish to congratulate you on the improvement which you have made in the paper.

Those of us who still remain true to our first love of wind jamming are inclined to be rather jealous and appreciate greatly your realization of the fact that we still do exist.

Brooklyn, N. Y. M. R. BOYNTON.

Once the "First Boat of the Land"

Editor of THE RUDDER:

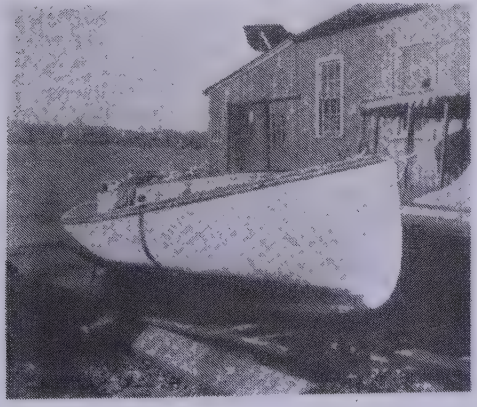
Sometimes old family horses end their latter days by living on the fat of the land and more often they don't. The same can be said of a boat. It often goes to augment some fellow's wood pile.

In view of the Democratic continuancy the accompanying photograph of Grover Cleveland's old fishing boat is of interest. Here she is on the ways at New London, minor repairs having been made on her for Fishers Island (N. Y.) parties.

If the old boat could talk, she could tell of many interesting events of her halcyon days in Buzzards Bay, of the "big ones" that got away and the big political deals that were probably hatched out in her cabin or the cockpit.

And, incidentally, can there be any significance in the fact that the old boat has moved to the Westward—the compass bearing of the Democracy's recent salvation?

New London. JAMES K. MURPHY.



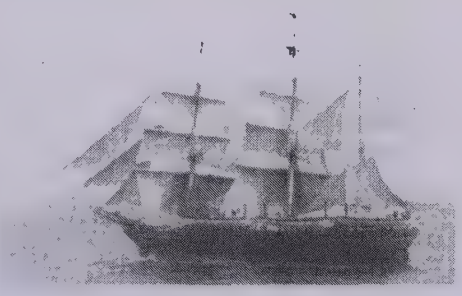
Catboat Used by Grover Cleveland When Fishing on Buzzards Bay

Oldest Whaling Bark

Editor of THE RUDDER:

Enclosed you will find a photo of an old whaling bark which was taken by E. J. Edwards, master of the fishing steamer Amagansett, of Promised Land, N. Y. The whaler is the Charles W. Morgan and is the oldest whaling vessel in the world. She was built at New Bedford in 1841. On one voyage on which she started May 10, 1911, she brought home 3,000 barrels of sperm oil and 15 pounds of ambergris She finished this voyage in 27 months.

Long Island. J. CUSTIS LAWRENCE.



Whaling Bark, Chas. W. Morgan

Praise for the March Rudder

Editor of THE RUDDER:

I have just received a copy of the March RUDDER. I want to congratulate you on getting out the best looking issue that I have ever seen of THE RUDDER. It has the ear marks of prosperity—which I am glad to see.

Massachusetts. A. W. FINLAY.

* * *

Editor of THE RUDDER:

I have the March number of THE RUDDER, which I appreciate very much. The magazine as a whole could not be improved on and the "Seven Ages" insert is one of the handsomest, most cleverly conceived and executed pieces of printing I have ever seen.

Pennsylvania. HENRY LOWE BROWNBACK.

* * *

Editor of THE RUDDER:

Allow me to express my appreciation of the marked and progressive improvement taking place in THE RUDDER. It is the only nautical magazine that I have ever read with keen pleasure.

New York. ARTHUR BUTLER GRAHAM.

Editor of THE RUDDER:

Thank you for calling my attention to the expiration of my subscription. I will give up all other magazines in preference to yours.

H. W. MERRIMAN.

The Chart Table

Editor of THE RUDDER:

Why does not the electric wire to the binnacle light affect the compass needle? I thought that electric currents induced a magnetic field around the wire that conducted them.

Rhode Island. X. Y. Z.

They do, but by twisting them around each other the positive wire counteracts the effect of the negative wire. Always be sure that the wires are twisted right up to the lamp connections.

* * *

Editor of THE RUDDER:

When is a sailing ship said to be on the starboard tack and on the port tack?

Iowa. NOVICE.

A sailing ship with the wind blowing on to her starboard quarter is on the starboard tack, and on the port quarter on the port tack.

* * *

Editor of THE RUDDER:

In running long courses, where the variation is constantly changing, how do you apply this variation to your true course to obtain the magnetic course?

Connecticut. F. K. WOOD.

The method used in the merchant service is to divide your course into a number of even lengths, depending on the rate of change of the variation, and find the mean variation, which is the variation at the center of each length, and apply this to the true course, which gives you the magnetic course to steer for that portion. On the great circle courses across the Atlantic we divide the course into 200-mile lengths, giving two courses for the twenty-four hours. Approaching this coast the variation changes much faster and we divide it into either three or four courses. Of course, the deviation also has to be applied to obtain the correct magnetic course to steer.

* * *

Editor of THE RUDDER:

What does the abbreviation G.M.T. mean?

New York. CURIOUS.

G.M.T. stands for Greenwich Mean Time, or the time registered by the clock in the Observatory at Greenwich, England. It is the time kept by the chronometers on nearly all the ocean merchant vessels and is just five hours earlier than clock time in New York, which is 75th Meridian time, known as E.S.T. or Eastern Standard time.

* * *

Editor of THE RUDDER:

Is a trough of mercury the best kind of artificial horizon for use ashore?

Connecticut. J. L. O'NEILL.

You can buy a polished bronze plate fitted with levels and leveling screws which, for shore work, is the best artificial horizon. It is unruffled by the breeze or shocks of passing traffic.

Editor of THE RUDDER:

I have a 45-foot power cruiser and intend to cruise along the coast this Summer. What kind of compass would you advise me to install?

New York. CRUISER.

A liquid compass, 4½-inch diameter card, of a standard make will be the most satisfactory for your power boat. A liquid card is much steadier than a dry card and is the only kind that should be used on a small boat because of the quick motions of the boat. There are some cheap compasses on the market, but although they look to be as good as the more expensive article they are worse than useless. Accuracy and reliability are the essentials of a good compass, so pay a few more dollars, and get a scientific instrument and avoid the blacksmith-shop product. Have it properly installed. Be sure your lubber lines are parallel to the fore-and-aft line of your yacht. All adjacent iron or steel must be permanently fixed and have as little of it as possible. Beware of untwisted wires carrying electric currents in the vicinity and be sure the binnacle is fastened securely to a solid part of the vessel.

* * *

Editor of THE RUDDER:

If you meet another vessel head on or nearly so and give one blast of the whistle to signify your intention of passing port to port and he answers with two blasts, what is the proper thing to do?

Pennsylvania. J. G. KILGOUR.

Repeat your signal and continue to act accordingly, by porting if necessary. If he still persists in crossing your signals and there is risk of collision, give three blasts on your whistle to signify your engines are going astern, to take the way off her.

The Engine Room

Editor of THE RUDDER:

What is the object of outside water connections between the cylinder and cylinder-head jackets of the 20th Century engine, at the New York Show?

New Jersey R. J. WILKINS.

The principal objection to the removable cylinder head in marine gasolene engines is due to the possibility of a leak of water into the cylinder through a defective cylinder-head gasket. The cylinder and cylinder-head jackets are connected by means of openings with sometimes a narrow packing surface. When using outside connections, both surfaces can be made much wider and the danger of a blow-out or getting salt water into the cylinder is reduced to a minimum.

* * *

Editor of THE RUDDER:

Are there any Knight sleeve valve marine engines made? Outside of quiet running, do Knight engines develop any more power at the same bore and stroke than poppet-valve engines?

Ohio. R. A. HUTCHINSON.

So far as we know, no manufacturer offers Knight engines in marine type. Looks as if you had omitted a part of your second inquiry. The principal claimed advantage of Knight engines is quiet running. A Knight

engine of 4-inch bore and 6-inch stroke employs two sleeves within the usual cylinder bore, the piston being 4 inches in diameter approximately. The walls of each cylinder sleeve are ⅛-inch thick. Accordingly the cylinder bore of a 4-inch Knight engine would be 4½ inches. It would therefore be possible to convert a 4-inch bore Knight engine into a 4½-inch bore poppet-valve type with a piston displacement some 26.875% greater using the same cylinder. Knight construction, it will be seen, reduces power possibility. We do not see why a Knight engine should give more power than those of usual construction, bore and stroke, and the number of cylinders and speed being the same.

* * *

Editor of THE RUDDER:

What is meant by the torque of a gas engine, and how can it be measured or computed?

Connecticut. B. B. WILKINS.

Perhaps it would be best to explain this force in a simple manner in order to have it better understood than to give you a technical definition. If you have ever operated a gas engine, you know that when it is running the tendency of the engine is to lift up on one side. If the engine is running right-handed the left side of the engine is liable to lift. This force is known as torque. If your boat is narrow you may have noted that when running there was a slight tendency of the boat to heel or list to the starboard if the engine is running right-handed. This is due to the torque of the engine, which is absorbed by the boat. The torque of an engine is computed by means of a Prony brake, water brake, fan, electric dynamometer, etc. If the developed horsepower is known, the torque may be computed from it, even as the horsepower may be computed from the torque.

Editor of THE RUDDER:

Can you advise me what type of engine, bore, stroke and make of engine to use in my boat if I will send you blue prints and specifications?

Virginia. ANDREW FITCHETTS.

We will be glad to help you in any way we can consistently, but we would hardly care to advise the use of any particular make of engine.

* * *

Editor of THE RUDDER:

Which is better to use on a cruising boat, a four or three-bladed propeller?

New Hampshire. J. H. H. MIDDY.

Providing you can get sufficient blade area we prefer to advise a three-blade wheel. If there is not sufficient room to swing a wheel of the proper diameter it may be necessary to use a four-blade wheel.

* * *

Editor of THE RUDDER:

Briefly my trouble is:

Boat is a 40-foot cabin cruiser, 14-h.p. Gideon engine (Hot head). Have much trouble with cylinder, owing to formation of carbon. Is there any preparation can be fed with fuel to counteract this? We use kerosene oil, 120° test. Would 150° test be better?

Newfoundland. X.

A small amount of water allowed to drop into the intake pipe, if your engine is of the four-stroke-cycle type, and into the by-pass if two-stroke-cycle, seems to prevent the accumulation of carbon by softening it. The lighter 120° kerosene is better than the 150° for hot ball engines. Your engine is probably an English product.

Miami's Midwinter Regatta

THE event in which Carl G. Fisher's Shadow III set a new world's mark for express cruisers on a circular course, marked the big show at the Midwinter Speed-Boat Regatta held at Miami, Fla., February 15th, 16th, 17th. Hundreds of yachts in full flag dress lined the course on the West, while thousands of spectators in automobiles and in the grandstand watched the three days of racing sport at the South Florida resort city. Biscayne Bay, blue with the waters of the South Atlantic and kissed by gentle breezes, seemed to add to the ideal conditions for racing during the three days and the thousands of Northern tourists and visitors in Miami enjoyed the sport.

While every race that made up the three-days' program was interesting and spectacular, yet the regatta was not up to the anticipated high standard because through disappointing circumstances several speed boats, both in the open displacement and cabin cruiser events, failed to enter. Several failed because of crowded conditions of the boat-building business in the North, in which these speed boats were not delivered on contract time. Others from various causes failed to enter, one having been swamped in an inland river while on her way South to participate in the open events.

However, when the Raven III, owned by Commodore Chas. W. Kotcher, and the Shadow III, owned by Carl G. Fisher, of Miami and Indianapolis, and Huston Wyeth's Boomerang lined up for the first express cruiser events, the crowds felt that they would get the full value of their admission tickets. For three days these cruisers crowded each other, the Shadow and Raven affording the sport, for they are twin boats alike in every detail excepting color, and they nipped and tucked for the honors in exciting races. The Boomerang was outclassed, yet she held a close third in every race.

The second day's events witnessed a new world mark for cabin cruisers when the Shadow covered the 10-mile race at a speed of over 29 miles per hour, breaking the previous high mark set by the Countess, owned by Wm. H. Hand, of New Bedford, Mass., which raced at a speed of over 27 miles per hour in the Block Island, Long Island Regatta in 1916. More credit is also due the Shadow because she made these high marks on a circular 2½-mile track while the 1916 record was made on a straightaway course.

The Open-Displacement races were won by Chas. Deering's Mar-y-cel over the Otgadai, driven by her



Grand Stand and Judges' Stand
Carl G. Fisher Handling the Shadow III

Huston Wyeth's Boomerang

Mar-y-cel, Chas. Deering, Owner
Raven III, Chas. W. Kotcher at the Wheel

owner, Fred Betz, and the Baby Glen, owned by Glen Curtiss and equipped with two aeroplane engines. The Mar-y-cel covered the 20-mile event of the second day in 37 min. 39 sec. She is a beautiful and graceful boat and ran perfect races during the entire program of events. These three boats, dissimilar in size and construction, afforded keen sport for the fans, who were especially pleased with the manner in which these boats made the turns at the North and South ends of the course.

On the third day in the handicap race the Baby Glen won the honors and during the entire race she was hid beneath the spray of her speed.

On this last day the express cruisers set another world's record when the Shadow and the Raven, driven by their owners, raced for the championship cup. This was the prettiest race that power-boat enthusiasts ever witnessed. Shadow took the lead in the start and Fisher drove her the entire ten miles for a steady gain over her sister competitor, the Raven. The official timekeeper's stop-watch gave her a new record of 30.1 miles per hour, and those who witnessed this event declared it to be the finest effort of any boat that ever tried to break a world's record in a 10-mile race.

The three-days' program of boat racing was interspersed with aeroplane flights and stunts performed by instructors in the Curtiss Aviation School of Miami. Phil Rader looped the loop several times in succession in a military tractor while other flying boats engaged in flights around the race-course.

The Regatta events, however, did not close with these three days of sport. On each of the Saturdays succeeding these races there were long-distance offshore ocean races from Miami between Raven III and Shadow III.

On February 24th, the Raven won the 50-mile race to Gun Key Light against a Northeast gale and a choppy sea. Her time for the entire distance was 2 hrs. 35 min. The Shadow crossed the line just three lengths behind.

March 3d witnessed the second long-distance race from Miami to Key West—a distance of 161 statute miles, in which the Shadow III gained the trophy in 6 hrs. 17 min. At 9 a. m., March 11th, these twin boats raced from Miami to Palm Beach Pier, covering the distance of 71 miles in 2 hrs. 48 min. In this event the Raven III gained the cup.

The final race of the Regatta season at the Southern metropolis will be from Palm Beach Pier to Miami.



Raven III, Chas. W. Kotcher's Winner of the Gun Key Light Race

Yachts Building for 1917

PART II

All the building yards are busy. Yachtsmen this season placed their orders early with the result that much of the work on the new yachts is well advanced. Many of the new boats are being built with the likelihood of their being used in defense work. Some are high speed while others are of the old-fashioned cruising type. THE RUDDER *this month supplements the list published last month, which gave details of many of these new boats. Owners, designers, hull and engine builders and others interested are requested to send in information for the extension of this list. Some of the boats mentioned in this list were built late last year. These are marked with the figures 16 in front of the name.*

GAS AND DIESEL ENGINES—Continued

Name of Yacht	Owner	L. O. A. Ft.	In.	B. Ft.	In.	D. Ft.	In.	Designer	Builder	Engine, Maker	No.	H.P.
.....	C. Earle Arnold	46	—	9	—	2	6	Swasey, Raymond & Page	Britt Bros.	.....	...	...
16 Emoh III.	C. H. Sunderland	43	6	8	6	2	6	F. K. Lord	Greenport B. & Con. Co.	Van Blerck	(1)	108
16 Salome	Henry Ringling	43	—	10	6	2	—	Great Lakes B. B. Cor.	Great Lakes B. B. Cor.	Van Blerck	(1)	140
16 Allegria	J. E. Zimmermann	41	6	10	1	3	6	Bowes & Mower	J. C. Vanderslice	Loew Victor	(1)	60
16 Sophia II.	Ferd R. Patzowsky.	40	5	9	5	2	4	Carl Adams	Carl Adams	Sterling	(1)	150
Madeline III.	Owen Reilly	40	—	9	8	3	4	S. G. Bannar	S. G. Bannar	Niagara	(1)	55
16 Bluff	R. T. Wilson	40	—	9	—	2	6	Great Lakes B. B. Cor.	Great Lakes B. B. Cor.	Van Blerck	(1)	108
.....	A. F. Clarke	41	—	9	6	3	1	G. R. Richardson	Richardson B. Co.	.....	...	...
.....	W. M. Matthews	40	—	7	10	3	—	E. N. Burwell	.....	.....	(2)	240
16 Marguerite II.	H. C. Good	40	—	9	6	3	0	Great Lakes B. B. Cor.	Great Lakes B. B. Cor.	Van Blerck	(1)	108
Aztec	G. W. C. Drexel	40	—	—	—	—	—	Bowes & Mower	J. C. Vanderslice	.....	...	...
Marjo	Jos. McAleenan	40	—	—	—	—	—	Albany Boat Cor	Albany Boat Cor.	Duesen berg	(1)	400
Adventuress.	Clifton Kain	38	—	12	—	4	—	J. Murray Watts	J. E. Whitehall	Mianus	(1)	18
Secret	Peter V. Giffin	37	—	—	—	2	—	W. H. Haff	W. H. Haff	Sterling	(1)	...
.....	M. S. Cornell, Jr.	31	—	7	10	2	8	W. H. Hand, Jr.	.....	Van Blerck	(1)	...

AUXILIARY

Sch. Elsie II.	F. B. Bower	88	—	20	—	7	—	Bowes & Mower	Hodgdon Bros.	Standard	(1)	80
Sch. Veda	S. Ross Campbell	60	—	17	3	4	6	S. C. Van Sant	S. C. Van Sant	Standard	(1)	54
Sch.	H. C. Corson	60	—	14	—	8	—	B. B. Crowninshield	.....	.....	(1)	...
Sch.	W. H. Hand, Jr.	48	—	12	3	5	11	W. H. Hand, Jr.	C. A. Anderson	.....	(1)	40
Sch.	M. S. Kattenhorn	44	6	12	—	6	6	Thos. A. McManus	.....	.....	...	...
Kch. Maiko	Wm. Bross Lloyd	44	1	12	—	5	6	W. H. Hand, Jr.	Geo. Lawley & Son Cor.	Sterling	(1)	20

SAIL

										Class	K	Rig
Nimbus	Joseph F. Feder	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	A. B. Alley	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	Dr. James Bishop	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	James B. Ford	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	H. H. Raymond	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	W. R. Timken	59	10	12	—	7	10	Wm. Gardner & Co.	Wood & McClure	O	K	Slp
.....	Samuel Dauchy	—	—	—	—	—	—	John G. Alden	W. B. Calderwood	R	...	Slp
.....	Charles E. Adams	—	—	—	—	—	—	John G. Alden	W. B. Calderwood	R	...	...

POWER YACHTS

										Engine, Maker	No.	H.P
Navette	J. P. Morgan	114	0	14	0	3	1	N. G. Herreshoff	Herreshoff Mfg. Co.	Herr'off M.C.	(2)	...
Privateer	R. A. C. Smith	108	9	13	0	4	6	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(2)	500
Chieftain	Chas. W. Armour	106	3	20	9	3	8	Mathis Y. B. Co.	Mathis Y. B. Co.	Winton	(2)	250
...	H. A. Laughlin	94	6	16	0	4	6	Wm. Gardner & Co.	Matthews Boat Co.	Winton	(2)	150
.....	.....	92	6	14	0	3	6	Esplen & Sons, Ltd.	G. Lawley & Son Cor.	Winton	(2)	225
.....	H. T. Guggenheim	86	6	12	9	4	0	Wm. Gardner & Co.	Gas Engine & Power Co.	Speedway	(2)	250
.....	J. P. Knapp	72	0	12	0	3	9	Tams, Lemoine & Crane	G. Lawley & Son Cor.	Winton	(2)	150
.....	J. T. Pratt	70	0	10	6	4	3	Tams, Lemoine & Crane	G. Lawley & Son Cor.	Winton	(2)	150
Peg o' My Heart	Wilbur C. Walker	67	0	13	0	4	0	F. S. Nock	F. S. Nock	Standard	(1)	75
.....	.....	66	0	11	4	3	3	Matthews Co.	Matthews Boat Co.	Van Blerck	(2)	350
.....	S. L. Avery	65	10	10	6	3	6	Bowes & Mower	Matthews Boat Co.	Duesenberg	(2)	800
.....	N. G. Herreshoff	65	0	17	1	4	0	N. G. Herreshoff	Herreshoff Mfg. Co.	Van Blerck	(2)	80
Gladorial	.....	65	0	12	0	2	2	E. Hunter Boat Co.	E. Hunter Boat Co.	Duesenberg	...	...
.....	E. A. Richardson	65	0	12	8	4	2	H. J. Defoe	Defoe B. & M. Wks.	.....	...	...
Sinco	H. F. Sinclair	60	0	10	6	3	0	W. H. Hand, Jr.	R. Jacob	Duesenberg	(2)	800
Perfecto	John J. Phelps	60	0	10	0	2	10	J. W. Hussey	Greenport B. & C. Co.	Duesenberg	(2)	800
.....	Charles Gardner	56	6	12	9	4	0	G. R. Richardson	Richardson Boat Co.	Blount	...	...
Imova	H. B. Endicott	55	0	11	2	3	0	F. D. Lawley	G. Lawley & Son Cor.	Sterling	(2)	220
.....	Scipion F. Cortes	55	0	10	0	2	10	H. J. Defoe	Defoe B. & M. Wks.	.....	...	...
Elkhemia	N. P. Whitaker	52	0	11	4	3	0	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	130
Toxaway	J. H. Nunnally	52	0	11	4	3	0	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	130
Sunbeam III.	R. B. Roosevelt	52	0	11	4	3	0	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedwa	(1)	130

THE RUDDER

Published on the Twenty-Fourth of the Month
BY
THE RUDDER PUBLISHING COMPANY
254 West 34th Street, New York, U. S. A.
To whom all communications should be addressed
Down Town Sales Office
9 MURRAY ST., NEW YORK
Arthur F. Aldridge, President
Andrew Paterson, Vice-President and Business Manager
James R. Thomson, Treasurer
Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

Considerable of the space in THE RUDDER this month is devoted to preparedness. It is the most important topic of the day and as a great deal of the preparation for coast defense must be done by the yachtsmen of the country, as it has been done by yachtsmen all over the world, they are interested in what is being done and in learning what they can do.

The United States has a large and very efficient Navy, but if it were double the size it would not be large enough to protect the enormous coast-line from attack. Builders are rushing work on new vessels but even were these completed the Navy would be woefully deficient in small craft suitable for patrol work or for service against submarines.

At least 4,000 power boats are needed. For the New York Naval District alone 1,000 are asked for. Many of these will be secured from yacht owners and others are to be built. The Navy Department has prepared plans of a boat suited for the work and it has consulted with boat-builders in all parts of the country, and very shortly it is expected that contracts will be placed for building these boats and they will be turned out in large quantities very quickly.

Then will come the trouble of manning the boats. This is even more serious than building them and an appeal has been made to the yachtsmen to enroll. Anyone who has had any experience at sea will be of value. He may know little of the real work required of him but he will soon learn and play an important part in the defense of his country against invasion. There are thousands of men who are actively interested in yachting and everyone of these should send in his name to the Naval Training Association or to the Navy Department.

It will be after the war is ended too that strength and preparedness will be needed. It will take months to frame the treaties of peace and the diplomats who are backed with power at home will be able to accomplish much more than those whose countries are weak and unprepared. The principles of right which this country will demand will have to be enforced by might and without might all the pleadings for right will be of no avail.

The Spanish-American War of 1898 taught, among other lessons, the value of a so-called mosquito fleet of small vessels for coast defense, to be manned by yachtsmen; the same lesson being forced upon England two years ago. Now that the might-have-been-expected has happened and this country is again face to face with the necessity for defense as well as offense, it is disconcerting, to say the least, to find that in the nineteen years that have intervened since the Navy Department was wildly buying yachts, converting them into coast defense craft, and enrolling and training yachtsmen, absolutely nothing has been done.

The same emergency finds the same conditions; no definite plans, no boats, and no crews to man them if there were boats; consequently, a rush to buy and build craft of various kinds. Instead of working from deliberately matured plans for a large fleet of small auxiliary craft, ranging from Red Cross and harbor patrol boats up to offshore patrol and sea scouts, the Navy Department is at sea on the vital issue and concentrating its efforts on the one detail of submarine chasing at speeds of from 30 to 40 knots.

With a full recognition of the importance of fighting the undersea boat and the possible value of extreme high speed for certain limited service, there still remains the plain fact that the backbone of an adequate mosquito fleet consists of a variety of craft of moderate speed and capable of being handled by yachtsmen of limited experience.

The uses of such boats are many. For the smallest or harbor class alone there will be mine fields to be guarded, rules to be enforced, and a large variety of general police work; and it is safe to say that in the event of war a fleet of five hundred of these boats could be used to advantage on the Atlantic Coast from Maine to Florida. Further than this, such a fleet of small independent units working alongshore would be the best possible training school for yachtsmen before they are qualified for service in larger and faster craft working offshore.

While deliberating over plans for high-speed submarine chasers costing enormous sums, the Navy Department could do nothing better than to put under immediate construction in the various yacht yards a fleet of at least one hundred craft of under 50 feet length, modeled closely after the average American power cruiser; speed not over 12 miles, staunch and seaworthy model, plain and heavy construction with provision for one or two small guns, a strong, heavy reliable engine of a type with which yachtsmen are familiar; the arrangement plan being fitted for two officers and a crew of four to six.

If by good fortune war should be averted, the comparatively small sum invested in such a fleet would not be wasted; the boats might be distributed among the yacht clubs of the coast and the Lakes, under such conditions as would insure their proper maintenance; to be manned by one or more crews organized within each club, and to be used regularly for systematic drill and training. The boats would remain the property of the Government, loaned under certain definite conditions, always under the supervision of the Navy Department; and there should be such coordination and cooperation between the Department and the clubs as would insure a regular system of naval training on the part of the crews. This much assured, in time of peace the boats

might be used for the ordinary purposes of yachting so long as there would be no interference with the routine of naval training.

The total outlay for such a fleet would be trifling compared with the sums now estimated as necessary for the high-speed auxiliaries, the possession of such boats by the clubs would be a tremendous stimulus to the work of the United States Power Squadron and similar organizations, and if after a year or so, they were called on for actual war service there can be no doubt that the result would fully justify the experiment.

The Navy Department is favoring a boat at least 110 feet long for the patrol fleet. The boats under 110 feet in length are not regarded as suitable for heavy outside work. Some years ago the navies of the world had large fleets of torpedo boats. These boats, built of steel, were driven by steam engines and attained high speed. They were superseded by the torpedo-boat destroyers which, as their name implies, were built to destroy torpedo boats. Now the torpedo boats in form, if not in name, are to be revived and the new patrol fleet will be similar in size, speed and form to the old torpedo boats.

Commodore W. S. Dagg, from Australia, who has been visiting New York, called at THE RUDDER office recently. Commodore Dagg is an enthusiastic yachtsman and naturally is intensely interested at present in the outcome of the war. He was crossing the Indian Ocean when the German cruiser Emden was sinking merchant ships of the Allies and his experience then was exciting. Commodore Dagg said that while the war had taken many of the younger men from Australia and had naturally depleted the ranks of the yachtsmen, the sport was still flourishing. In his club many of the older members, who had retired from active interest and had relegated themselves to the Rocking Chair fleet, had renewed their youth and were sailing small craft as they did in their earlier days. This was done purely in the interest of the sport and to keep it alive. They have sailed many exciting races and are as keen as they ever were. This method has also been followed in many other clubs in Australia. Commodore Dagg's visit to us was a very pleasant one. THE RUDDER staff is always pleased to meet visitors and to learn from them about yachting in other sections. We extend a cordial invitation to visitors to this city to make us a call.

The Warrior, an English-built steamer, has been transferred to the British Naval authorities. This yacht was originally built for F. W. Vanderbilt and has been owned in turn by the late Alfred G. Vanderbilt, Harry Payne Whitney and Alexander Smith Cochran. The transfer was made in Kingston Harbor, Jamaica, and thus international complications were avoided. It is rumored that Mr. Cochran, who has been a liberal contributor to the British, made a present of the yacht and that he has received a commission in the British Naval Reserve and will have charge of the Warrior.

Efforts have been made to purchase the Vanadis and the Cyprus, but as these two yachts are in American ports they cannot be transferred to an alien government.

The Warrior is only one of many American steam yachts that are doing war service. Among others are The North Star, Atalanta, Josephine, Lysistrata, Nahma, Columbia and Winchester. Practically all the British-owned yachts are in the service, some as hospital ships, others as scouts and patrol vessels. It is very doubtful if any of these will be useful as yachts when the war is over. All have been handled roughly. They have been laid alongside piers to coal, coal carriers have been run over the decks and the engines have been driven to death almost. It is the same way with the power craft and that huge fleet will be fit for junk very soon.

This should indicate that there will be busy times for yacht designers and builders ahead. Yachts of all sizes will be wanted in this country and abroad. The foreign yards will have all they can do with commercial vessels and there should consequently be lots of work for American yards.

Several designs have been received for THE RUDDER prize competitions. Some are for the Fishing Boat Contest and others for the interior arrangements, etc. A cursory glance over these designs shows that the contestants have worked hard to win the prizes, and the plans themselves are very commendable not only for originality shown but for their neatness and detail. The Fishing Boat Contest closed on March 1st. Six plans have been sent in for the prizes offered in this competition. The gentlemen who have agreed to act as judges have not yet rendered their decisions. They will do so in a few days and the winners, together with their plans, will be published in the May issue of THE RUDDER.

The other competition will close on April 2d, and there are yet a few days left in which designs may be finished and sent in. These plans will be turned over to the judges as soon as received and an announcement made as soon as possible of their decisions.

The supplement to THE RUDDER this month is the steam yacht Gem, owned by William Ziegler, Jr. She is a twin-screw steel vessel, built by the George Lawley & Son Corporation, at Neponset, Mass., in 1913, from designs by Cox & Stevens. The general dimensions of the yacht are 164 feet over all, 153 feet 6 inches on the water-line, 18 feet breadth, 10 feet 2 inches depth and 7 feet draught. She is driven by two sets of triple-expansion engines and is quite fast. She will make an admirable scout boat.

Men are wanted for the patrol fleet and not officers. The yachtsman who enrolls has lots to learn about guns, mines, torpedoes, and bombs before he will be fitted to command or assist in the command of a patrol boat. Many are now studying at the Navy yards and are becoming efficient. Others who have only acted as sailors on some racing sloop will be valuable and can earn promotion as do the men who enlist in the National Guard. Captain C. L. Poor recently suggested several books which he recommended to those who wish to study Naval routine and other matters which a competent man on a patrol boat should know. A list of these books will be found advertised in another section of THE RUDDER.

Spokes from the Rudder Wheel

J. Adolph Mollenhauer has named his new 70-foot power yacht, building at the plant of the Gas Engine & Power Company at Morris Heights, Anado. This yacht will have a breadth of 13 feet and draw 3 feet, and be driven by two engines of 175 h.p. each.

* * *

The 77-foot cruiser, building by the Matthews Company at Port Clinton for George H. Ketcham, will be driven by two Winton engines of 120 h.p. each.

* * *

When the war with Spain began nineteen years ago F. Augustus Schermerhorn was one of the first of the yachtsmen to turn his yacht, the Freelance, over to the Government. Freelance was used until the war ended and returned to Mr. Schermerhorn. He has again placed the Freelance at the disposal of the Government and the offer has been accepted.

* * *

Fred M. Hoyt is to have a Marconi rig put on his sonder boat Skeezix. There are a few sonders left at Marblehead and the innovation will be watched with much interest.

* * *

Three Class R sloops are being built at Calderwood's yard at Manchester. They are for Charles E. Adams of the Corinthian Y. C., Samuel Dauchy and Ogden P. McClure, of Chicago. The designs have been drawn by John G. Alden.

* * *

A 62-foot wooden cruiser of the Scout type has been ordered by David C. Percival, Charles M. Barker and B. Devereux Barker, of the Eastern Y. C. It is to be built at Herreshoff's from designs by A. Loring Swasey.

* * *

John McCormack, the Irish tenor, has named his new 57-footer, building at the Gas Engine & Power Company yards, Gwen II. This yacht will be a duplicate of the one exhibited at the power-boat show and will be driven by two Speedway engines of 130 h.p. each.

* * *

Morton F. Plant's high-speed cruiser, building at Jacob's yard from designs by W. H. Hand, Jr., is to be named Monon. It will be equipped with two Duesenburg engines of 400 h.p. each.

* * *

Russia has placed another order with the Greenport Basin & Construction Co., for patrol boats. Eight are to be built. They are 72 feet long and will make 32 miles an hour. Each will have three Duesenberg engines, making a total of 1,200 h.p.

* * *

A. C. Schantz's 63-foot cruiser, building at the American Boat Company from designs by C. G. Davis, is to be named Silver Heels, and will be driven by a Van Blerck engine of 140 h.p.

* * *

Henry Hart, of Buffalo, is having built by George Elliott, of that city, a 40-foot V-bottom runabout from designs by W. H. Hand, Jr. This is the first 40-foot runabout that Mr. Hand has designed. The boat will be driven by a 200-h.p. Model-F Sterling engine and will make 38 miles an hour.

* * *

N. Bruce Mackelvie is having a 90-foot power cruiser built by the Matthews Company, which has been designed by Gielow & Orr. This yacht will have a breadth of 16½ feet and will draw 5½ feet. The power plant will be two Winton engines of 160 h.p. each.

* * *

The members of the Bensonhurst Y. C. have arranged for a free course of instruction in Navigation and Seamanship. These lectures will be illustrated and followed each evening by practice with charts and instruments.

* * *

Commodore Howard C. Smith of the Seawanhaka-Corinthian Y. C. has announced to the members of the club that, as an aid to the Navy Department in the preparation and organization of Scout Patrols, an informal class in practical navigation has been arranged for. A competent instructor has been engaged and the meetings will be held in the Harvard Club on Monday and Friday evenings. If there are twenty subscribers the cost will be $15 each.

* * *

The Vidofner II has been sold by the estate of Richard Patzowsky, Wilmington, Del., to John Ringling through the office of Cox & Stevens. Vidofner II is a twin-screw yacht 110 feet long and was formerly the Cynthia III and owned by Merrill B. Mills, for whom she was built.

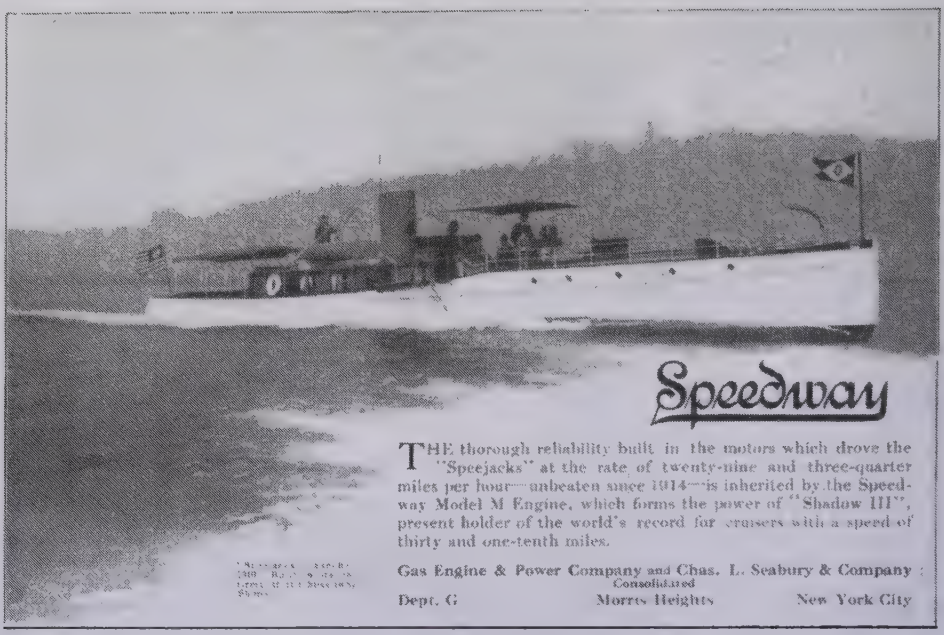
* * *

The Council of the American Power Boat Association at a meeting recently offered the services of the Association to the Navy Department to aid recruiting. A committee, consisting of A. L. Judson, C. P. Tower, T. B. Taylor, C. M. English and J. M. Wallace, was appointed to arrange a program by which the 28,000 members could be reached.

THE RUDDER



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Supplement to The Rudder

ARTHUR MEEKER'S S. Y. ARCADY

A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | May, 1917 | No. 5

To Build 345 Patrol Boats for the Navy

CONTRACTS for the building of three hundred and forty-five of the 110-foot so-called submarine chasers have been awarded by the Navy Department. Of these two hundred and ten are to be built in private yards, and the remainder in the Navy yards. The Navy Yard in Brooklyn has started work and will have the first of this fleet ready by June 1st. Nine more are to be completed by July 1st and after that ten are to be finished each month until sixty are finished by December. The New Orleans Navy Yard is to build six, one a month after July 1st, the Charleston Navy Yard, eight, the Norfolk Navy Yard, twenty-one, the Mare Island Navy Yard, at California, fifteen, and the Puget Sound Navy Yard, twenty-five.

The awards to date are as follows:

Charles A. Dean, Alexandria, Va.	20
Geo. Lawley & Son Corporation, Boston	20
New York Yacht, Launch & Engine Co., Morris Heights, N. Y.	20
The Elco Co., Bayonne, N. J.	16
C. Hildebrandt Dry Dock Co., Kingston, N. Y.	15
The Mathis Yacht Building Co., Camden, N. J.	15
The Matthews Co., Fort Clinton, Ohio	10
International Ship Building and Marine Engine Co., New York	10
Geo. Stelz, College Point, N. Y.	10
Howard E. Wheeler, Brooklyn	9
Eastern Shipyard Co., Greenport, L. I.	5
Gibbs Gas Engine Co., Jacksonville, Fla.	5
Robert Jacob, City Island, N. Y.	5
Kyle & Purdy, City Island, N. Y.	5
Luders Marine Construction Co., Stamford, Conn.	5
The Newcombe Life Boat Co., Richmond, Va.	5
F. M. Blount, Pensacola, Fla.	4
Alex. McDonald, Mariners Harbor, N. Y.	4
Barrett Shipbuilding Co., Mobile, Ala.	3
Chance Marine Construction Co., Annapolis, Md.	3
Hodgdon Bros., East Boothbay, Me.	3
Vinyard Ship Building Co., Milford, Del.	3
Camden Anchor-Rockland Machine Co., Camden, Me.	2
Dubuque Boat & Boiler Works, Dubuque, Iowa	2
Great Lakes Boat Building Corp., Milwaukee	2
L. E. Fry Co., Clayton, N. Y.	2
Hartman Greiling Co., Green Bay, Wis.	2
Rocky River Dry Dock Co., Rocky River, Ohio	2
Smith & Williams, Salisbury, Md.	2
Burger Boat Co., Manitowoc, Wis.	1



Kanawha, Sabalo and Tarantula Putting on War Equipment at the Yards of the Gas Engine & Power Company, Morris Heights

The total cost of the two hundred and ten boats to be built outside the Government yards will be $10,741,063, and the average price of each boat so built is $51,100.

These boats are to be built of wood and will be 110 feet long, 15 feet breadth, 4 feet 6 inches draught. In planning them the Navy Department had hoped to have them fitted with two engines of full 300 h.p. each. A slow-turning engine was wanted and a speed of 18 knots was hoped for. These wants caused much trouble. It was found that there was not an engine on the market to meet these requirements, and in order to get the speed figured on it was finally decided to fit the boats with three Standard engines of 200 h.p. each and to use an 8-h.p. engine of the same make for auxiliary purposes. The British 80-footers have two of these engines and the smaller one for auxiliary purposes. Four engines and other machinery in the engine room will clutter up that room and be one bad feature of these boats.

A contract has already been placed with the Standard Motor Construction Company of Jersey City for 450 engines of 220 h.p. each and 150 engines of 8 h.p. each.

The boatbuilders are simply to build the hulls and install the engines when they are ready. The cost of the engines, the interior fittings, the wireless outfit and other necessaries on these boats are all extra, so that the total cost of each will be very close to $100,000, or about $20,000,000 for the two hundred and ten boats. A few of the builders have agreed to begin to make deliveries next July but the majority of them want five months to build the first boat and the whole fleet it is hoped will be completed before the end of the year.

It is a matter of opinion as to which is the better, two 80-footers at $50,000 each or one 110-footer at $100,000.

On this question naval architects will differ. All generally agree that the longer boat is better for the purposes for which it has been designed but whether one 110-footer can do the work of two 80-footers is debatable.

The way in which the Hon. Josephus Daniels, who apparently is the Navy Department, handles the designing and building of these "submarine chasers" is a topic of conversation all through the boatbuilding industry. Having settled the size and model of the boat and having had opportunities to study the plans of the British, Russian and Italian boats, those built in this country and those built abroad, and presumably having taken some advice from the Naval Constructors, a boat longer than any yet built for this purpose was selected but the speed is much less than the speed of boats in European waters. The British boats make 19 knots and some of the Russian boats make more than 30 knots. But then again speed is a factor about which no two designers will agree. Naval officers, too, differ on the speed question; some would like high-speed boats while others prefer to go slowly and be sure of their boat.

Mr. Daniels requested the best known boatbuilders to visit him at Washington and talk over ways and means. The plans of the boat decided on were shown to the builders and they were invited to submit bids, and at the same time they were told that the bids must be very moderate, and they were urged to bend every effort to turn out the boats very quickly and in large quantities. It was pointed out to Mr. Daniels that the boat would be a costly one to build and being so much larger than any other boat used for the patrol service would take much longer to build.

The boatbuilders suggested a way by which much delay could be avoided and the cost kept down to a minimum. It was suggested that a committee of the boatbuilders be formed and that some Naval Constructor to represent the Department should be on that committee. The committee would then arrange for the purchase of all the material and fittings to be used in the building of the boats and buy sufficient to build as many as the Department required. Then the work would be standardized. The frames would be bent at one plant, planking cut at another, metal fittings cast at another and so on, and that when ready these parts should be shipped to the builders' yards, where they would be set up and the boats completed very rapidly. In this way all the small builders could be kept busy, as there would be work enough for all. The cost of material would be kept low because of the large quantities purchased and the builders were to be paid the actual cost plus 10% profit.

This suggestion did not please Mr. Daniels and he issued plans and specifications and asked for bids. When these bids were opened on the day set very few had been submitted. All the larger builders had been a little shy and so it was announced that the time would be extended to March 31st, and efforts were made to get more bids. By some mysterious means the prices in the first bids were allowed to leak out and when the new lot were received it was found that many were between $40,000 and $50,000, the prices named by some of the best builders in the original bids.

Several builders had offered to build on a percentage basis of 10 or 15% net profit plus actual cost. Some bids were way above $50,000, the highest being $99,000; some were very low, under $20,000. The Department rejected all the percentage offers, threw out some high ones as too high and rejected the very low ones as being too cheap for good work.

In the meantime the constructors in the New York Navy Yard were getting busy. They had gone into the lumber market to purchase the frames, planking, etc., and when the private concerns tried to purchase lumber they found the market swept clean. Consequently they are handicapped from the start.

The Government has been very busy arranging with the copper, steel and other industries to purchase materials at prices way below the market. The copper companies have agreed to furnish copper at 16 cents, just half the price in the open market. The steel companies have agreed to let the Government have steel at $59 a ton, while the present market price is about $72. When these announcements were made some contractors who have Government contracts got in touch with the copper and steel men and suggested that as they had Government work of course these special prices applied to them, but were told "nothing doing." They have to buy in the open market at current prices.

Then what happens. Later on there will be a howl against the boatbuilders. It will be shown that the boats built in privately owned yards cost a certain amount of money while those built in the Navy yards cost, say, 50% less. The gullible public will know nothing of the difference in the cost of materials to the private builders and to the Government yards. They will be allowed to assume that all things are equal. They will not be told that one reason for the difference is that the private yards have heavy overhead charges which are not taken into consideration in the Navy yards. In the Navy yards the cost of maintenance is paid out of the annual appropriation for the Navy Department, each yard being specially provided for. There are no taxes to be paid,

no new machinery to purchase for the special work, but by inference the public will be allowed to think that the private builders are a gang of robbers only too ready to get rich at the expense of the taxpayers.

It seems a pity that at such a time as this there could not be harmony. To meet the conditions it is necessary that all should pull together. The boat and engine men loyally offered their services and the use of their plants to help the Government in every possible way but instead of being met fairly they have been treated without any consideration at all.

Now they are up against another serious handicap. The Navy Department needs the help of skilled labor to build the boats and it is offering inducements to men in the private yards to take work under the Government at much more liberal pay than they are now receiving, and to hold their men it will be necessary for the builders to meet this offered inducement.

To build one of these 110-footers is a shipmaster's job. The framing is very heavy and the planking is two inches. Already three are planked in the New York Navy Yard and others are nearly planked and in this condition they show what a big undertaking it is to build so many of these boats. Contracts have been placed with several small yards, particularly in Southern yards, and it is very doubtful if these builders will be able to fulfill their contracts. It is singular, too, that some of the larger companies, such as the Gas Engine and Power Company, have no orders at all. This is one of the largest and best equipped yards in the country, and well fitted for such work. The Gas Engine Company offered to build several boats on a percentage basis but its offer was not accepted, as were similar offers made by other well-equipped concerns.

It is also noted that among the bidders were some concerns without any plant for building at all and these bidders figured on subletting their contract to smaller firms who had some boat-shop equipment. One firm has already communicated with builders asking them to agree to build boats for them.

When the first of the 110-footers was almost completed in the New York Navy Yard the constructors agreed, after a careful inspection, that the keel was too straight and that the boats would not handle as easily and as smartly as they should. A submarine chaser must be quick and lively and handle smartly or it will be an easy prey to the submarine. Some slight changes were then made in the plans. The draught forward has been cut away and some of the deadwood aft has been removed. This gives more rocker to the keel and will enable the boats to turn quickly and be much more handy.

It seems doubtful if the whole fleet of boats will be ready for several months. It is certain that there will be more or less scandal about letting the contracts, and in the event of the boats not coming up to expectations and not being ready for delivery on time the boatbuilding industry will be blamed and power-boat building will get a serious setback which will be very harmful to all engaged in it.



U. S. S. Chester, a Fast Scout Cruiser, Built by the Bath Iron Works; Length, 423 Ft.; Breadth, 47 Ft. 1 In.; Draught, 16 Ft. 9 In.; Speed, 26.52 Knots; Armament, Two 8-In. and Six 5-In. Guns

Famine of Nautical Instruments

THERE is a dearth of nautical instruments in this country and unless some way is found to supply the demand the shipping and yachting industries will be most seriously affected. Shipbuilding has boomed here since the war more than perhaps any other industry. Every ship yard is working to its full capacity. New yards with new work are growing like mushrooms. The Navy Department is speeding work on all its vessels, several hundred patrol boats are being built and now 1,000 wooden vessels of 3,000 tons each are to be built as speedily as possible in order to relieve ocean freightage and to furnish munitions and food stuffs to England and France to offset the depletions that have been made in the fleet of carriers by the German submarines and mines.

Where these vessels are to obtain the necessary instruments which will enable their navigators to safely guide them across the ocean is causing considerable worry. A vessel without a chronometer, a sextant, barometer, compass and binnacle, sounding instruments and other scientific tools is absolutely useless. Compasses and sounding instruments can be supplied because there are several expert compass makers in this country and little difficulty, comparatively, is being experienced in obtaining the necessary materials for their construction, but there is an absolute famine of chronometers and sextants. Marine glasses are very scarce and the supply of barometers is very limited.

This trouble has been brought about in a large measure by the lack of foresight of the legislators of the country. Before the war when the shipping industries were small there were a few concerns who were able to supply the demand. These concerns manufactured in a small way, imported instruments from England and France and had competent mechanics so that repairs could be made here. This was perfectly natural. England was the big maritime nation of the world and her ships were equipped at home as far as possible. The British chronometers and sextants could be made at home much cheaper than they could here and consequently they were imported into this country because it would not pay to build expensive machinery to manufacture the instruments needed.

Those manufacturers who were willing to develop the industry of making nautical instruments received no encouragement from the Government, instead obstacles were put in their way by passing laws which allowed builders of vessels to import instruments free of duty. In August, 1912, the Panama Canal Act was approved and one section of this Act says:

> That all materials of foreign production which may be necessary for the construction of vessels built in the United States and all such materials necessary for the building or repair of their machinery and all articles necessary for their outfit and equipment may be imported into the United States free of duty under such regulations as the Secretary of the Treasury may prescribe.

Franklin MacVeagh was then Secretary of the Treasury and on November 25, 1912, this department gave a decision defining the meaning of the section quoted from the Panama Canal Act. It defined vessels, materials, articles and then said:

> The term "outfit and equipment" is defined as including portable articles necessary or appropriate for the navigation, operation or maintenance of a vessel . . . . The term includes, therefore, anchor, chains, cables tackle, boats, repair parts, life-saving apparatus, wireless telegraph apparatus, nautical instruments . . . and also articles to be used in renewal or replacement of articles of original outfit and equipment.

It also ruled that neither materials for the construction or repair of vessels or of their machinery nor articles for outfit and equipment will be admitted free of duty when imported to be kept in stock for sale.

In October, 1913, the present tariff law was adopted and this law included the section of the Panama Canal Act and another Treasury Decision of February 7, 1914, defined the meaning of the section as it had in 1912.

All these laws and decisions meant that if those men who handled chronometers or nautical instruments imported such instruments for the purpose of selling them here they had to pay a duty, but if shipbuilders wished to outfit the vessels they were building they could send abroad, take the trade away from America and be allowed to bring the instruments into this country free of duty.

In August, 1914, the war began and then England and France needed all the instruments they could manufacture for their home use. An embargo was placed on the exportation of chronometers, sextants, compasses, binnacles, barometers, marine glasses and all navigating instruments. The British authorities swept their country clean commandeering all they could find. Importers here have been unable to get any instruments and they have also been unable to obtain any parts of instruments which are imported for assembly in this country. Then the boom in shipbuilding came. Every ship yard is working to its full capacity in building vessels and still more are to be ordered and where the instruments are to come from for the navigation of these vessels no one knows. Under present conditions they cannot be imported and there are no manufacturers who can supply the demand.

There are in this city just two chronometer makers, John Bliss & Co. and T. S. & J. D. Negus. These two firms also make compasses and binnacles and other nautical instruments and also import sextants and instruments. Other concerns throughout the country who handle such instruments are E. S. Ritchie & Co., of Boston, compasses, John E. Hand & Son Company, of Philadelphia, who manufacture some instruments, Riggs & Bros., of Philadelphia, and Charles C. Hutchinson, of Boston. John L. Bliss, who is an authority on chronometers and all nautical instruments, in conversation on the scarcity of these instruments recently said:

"If some big capitalist should offer me $5,000,000 without security and free of interest and tell me to establish some factory for the manufacture of chronometers and other nautical instruments, I could not do a thing. If I could secure six thoroughly competent and expert escapement men to begin the manufacture of chronometers, and it would be impossible to find six such men, it would be three years before the chronometers would be ready for use. By that time the war will be

over, we hope so at least, and then under the present laws, the shipbuilders here could bring over what they wanted free of duty and our factory would be idle. Making a chronometer is a long careful job. Some think that a chronometer keeps perfect time. I wish it did but it does not. It is a most delicate time piece, made absolutely by hand because it is impossible to stamp out by machinery the many parts as accurately as they are made by hand, and, by careful study and adjustment we learn just how much—a fraction of a second—each instrument loses or gains a day. A card is given with each instrument which tells when it was corrected to standard and the gain or loss the instrument makes each day. The captain then in taking his sights figures exactly the correct time. If we had 100 chronometers just from the factory it would be 15 months before they would be reliable enough to use on a short voyage say to the West Indies, and it would be some months later before they could be used on lengthy voyages. When a chronometer is new it has a tendency to accelerate, as we call it; that is, go faster and faster day by day. This acceleration is very rapid during the first few months but diminishes with lapse of time and in the course of three or four years generally disappears altogether. Then it has to be tested to changes of temperature. It will be run for a week in a temperature of 90° and its variations each day carefully noted. Then for a week it will run when kept in a temperature of 50°. The next trial will be at 70°, and these trials are made each week for months until we understand the instrument and know exactly what it will do. Each day it has to be compared with the standard. So you see how long it would be before any establishment could put its output on the market.

"The situation with sextants is almost as bad. Keuffel & Esser and the Sperry Gyroscope Co., of New York, F. E. Brandis Sons & Co., of Brooklyn, and the Warner & Swazey Co., of Cleveland, are making sextants, but how or in what quantities I don't know. To make a sextant a dividing engine is necessary to mark the degrees, and, to begin with, it would be a very difficult job to get such an instrument here. The degrees on a sextant cannot be marked accurately by hand and for the instrument to be of any value the degrees must be accurately marked down to the sixth of a minute. An error of one minute in making a sight would mean one mile in latitude. In normal times sextants cost from $60 to $150, but just now they will bring almost any price. The glasses used in these instruments are all made abroad, mostly in France, and none have been imported for a long time. There is what might be termed the single barrel of a marine glass, shade glasses and the horizon glasses which are usually imported unsilvered in every instrument.

"It is possible to use a good watch in navigating, but it must keep good time. An error of one minute in the time would mean a difference of 15 miles of longitude, quite enough to put a vessel on the rocks. A watch might be used in place of a chronometer but nothing will take the place of a sextant."

There are some manufacturers of glasses in Rochester and it is possible that they have prepared for such an emergency as the present. There has, however, been a great demand for field and marine glasses among the warring nations of Europe and it is probable that they have taken advantage of the big prices offered and depleted their stock. If they have, the Government here will have to do just what was done in England, commandeer all glasses and telescopes.

It used to be possible to find second-hand sextants and other instruments in the ship chandleries, junk shops and pawnbrokers, but now not one is to be found in these places. The officers of Swedish and Norwegian vessels who have visited American ports in the past two years appreciated the serious condition and they have gathered in every instrument they could find.

That the Government is beginning to appreciate the serious condition is shown by a letter sent by the Department of Commerce to John Bliss & Co. This letter said:

This Bureau is in receipt of occasional inquires asking where ship's chronometers may be repaired or purchased. We should be pleased to receive copies of any advertising matter which you may have descriptive of chronometers which you handle.

The reply sent to this inquiry was:

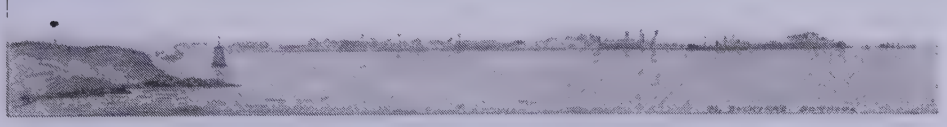
Three years ago we had abundant facilities for supplying new and second-hand chronometers and repairing the same, to handle the limited amount of business that came our way. Since the war in Europe started the demand for chronometers has advanced by leaps and bounds. We are prepared to do a certain amount of chronometer repairing work. Conditions have changed with such rapidity that it has been a physical impossibility for us to re-adapt ourselves to the same. We think it just as well that your bureau should be made acquainted with the true state of affairs.

In August, 1912, the Panama Canal Act was approved by President Taft and became law. A clause in this Act enabled shipbuilders to import chronometers, compasses and all kinds of nautical equipment from Europe free of duty. The same policy was incorporated in the Tariff Act of October, 1913. At that time no one anticipated the war in Europe and the life and death of American manufacturers of American nautical equipment was probably considered of little consequence. As one of the victims all we can say is, the legislation was disastrous to us. Whether such legislation was wise or not let those who are most interested and best competent, judge, now that European equipment is practically unobtainable.

To this the Department wrote:

We are in receipt of your letter of March 31st and have noted with interest what you have to say regarding the effect of the Panama Act and the Tariff Act of October, 1913, upon the production in the United States of marine chronometers. As this Bureau, however, has nothing to do with the tariff duties, we would suggest that you take the matter up with the newly organized Tariff Board, here in Washington.

Mr. Bliss says he intends to give that board the benefit of his views at once.



Old Glory

THERE has never been seen such a display of Old Glory as now, particularly in towns where patriotism is running rife. It seems as if every one who has been fortunate enough to procure an American flag is displaying it, and many who have been unfortunate and cannot get an up-to-date flag have displayed older flags and some seem very antiquated. They can easily be picked out, because the latest flag has forty-eight stars on the union, while older emblems have the stars equal in number to the States when they were made.

Flagmakers have been so busy that they have been unable to keep up with the demand, and now orders have to be placed with these flagmakers and delivery will be some weeks hence. Then, too, with the increased demand and, as the manufacturers say, because of the scarcity and increased cost of bunting, the prices have soared higher than the flags will fly, so that the high cost of living is now applied to flags.

The flag to be properly displayed should be flown from a staff, and it would seem that those who wish to display it properly could spend a little more money, perhaps a dollar, and get a staff and socket in which to set the flag. With this staff there will be no question as to the proper way to display it.

In the Army and the Navy the flag is treated with great respect. On shipboard it is hoisted at morning colors, eight o'clock, with appropriate ceremony and lowered again at sunset. At morning colors it is run up smartly to the peak of the staff, but at evening colors it is lowered slowly while the band, if there is one on board, plays "The Star-Spangled Banner" and the last piece of bunting disappears as the last notes of the anthem sound.

The Navy regulations apply to all vessels privileged to fly the American flag and all yacht clubs follow the Naval custom as far as possible. There are still a few clubs who fly the flag from a yard slung on the flagstaff. This is incorrect. The flag must be flown from the mast head by itself and other flags, such as the club burgee, displayed on the yard. The correct way, however, is to have a gaff rigged on the flagstaff and display the American flag on a hoist of its own. This is done on all Naval vessels.

The Army has a slightly different custom and Army regulations should govern all flag ceremonies on land. Article 437 of the Army regulations provides that at every military post or station the flag will be hoisted at the sounding of the first note of the reveille or of the first note of the march, if a march be played before the reveille. The flag will be lowered at the sounding of the last note of the retreat, and while the flag is being lowered the band will play the National Anthem, or if there be no band present the field music will sound "to the colors."

The Army has no regulation to govern the display of flags as they are seen on nine-tenths of the houses in any town. The Army regards this display as simply decorative and there is no proper method for the display. Some have maintained that some uniform way should be adopted to hang out the flag. One suggestion was that the union should be towards the North on streets or avenues running North and South, and to the East on streets running East and West. The idea is to have the flag always hanging in one position and have some symmetry in the display. Another idea is that the union, the part on which are the stars, should always be to the left as one faces the flag. With this ruling they would be one way on one side of the street and the opposite way on the other side. Until Congress takes the trouble to pass a bill regulating the display of the flag, or until the Army Department takes the matter in hand, flags will be displayed as their owners think fit.

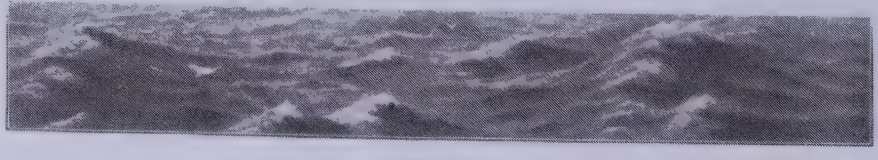
The flag should never be used for decorative purposes; red, white and blue bunting will do for this purpose. The flag should never be draped but be allowed to hang gracefully from the staff and flutter in the wind. It should always be handled with respect and not carelessly. A sailor or soldier will never allow the flag to touch the ground but will handle it as tenderly as a woman will handle a child.

Another question often asked is as to the propriety of keeping the flag out all night. It is pointed out that Francis Scott Key, in "The Star-Spangled Banner", wrote:

"And the rockets' red glare, the bombs bursting in air,
Gave proof through the night that our flag was still there."

This question was referred to Adjutant-General Simpson, stationed at Governors Island, N. Y. He said that there was no regulation preventing any private individual flying the flag day and night if he wished to do so. There is a special regulation for the Army and the same custom is followed in the Navy, that at the beginning and during an action in which the forts or the warships may be engaged the flag shall be kept mastheaded day and night until the action closes. So that those who wish to fly flags at night and don't mind the cost of flag and the natural wearing out of the bunting, may keep them up as long as they like.

In past years it was customary to keep flags half-masted on Decoration Day. The proper way to show respect to those who died in the Civil War is to masthead the flag until noon. Then to lower it to half-mast during the firing of the National salute, after which it is mastheaded until colors, when it is taken in.



A Vital Power in War

By A. E. Potter

THE present Titanic war which is devastating Continental Europe, as well as a part of Asia and of Africa, and into which the United States of America, together with several other nations of the Western Hemisphere, have recently been thrust, will be decided by force of arms, economic conditions, and—the internal-combustion engine. That this type of motive power is a vital one for victory, let none deny.

Few there are of us who can fully appreciate or more than begin to realize the importance of the gas engine in its relation to, and as an important factor in, present warfare needs.

The development of the gas engine has been marvelous. In 1876 the first stationary gas engine ever shown in this country was one of the great attractions of the Centennial Exposition. A few years later and this then little appreciated power has become a popular, convenient and in fact necessary means for the propulsion of boats, both for pleasure and profit. The immense automobile industry of today, ranking third in point of importance and production, owes its development to the possibilities of the gas engine. Not content with navigating the water and then the land, its further expansion finds us navigating the air, and not only the surface of the sea, but its depths.

There today are five entirely different, yet extremely important applications of the internal-combustion engine for war purposes, any one of which failing in its own field of action would make for failure at arms. These five applications or adaptations of the gas engine cannot be named in the order of their value for either offensive or defensive purposes, for none of us dare say which is the more potent, for each has its necessary place and duty to perform. The submarine cannot be said to be more important than the automobile used for the transport of men and munitions. The low-powered gasolene-driven ambulance fills its mission even as the Juggernaut armored "tank." The portable gasolene electric generating set, for furnishing current for searchlights and wireless telegraphy performs an exceedingly important mission in war, and the armored "tank" is a power unto itself.

To the layman it may seem that there is little difference in the design and construction of the gas engines which operate a motorcycle or an armored "tank," an airplane or a submarine, and yet there is so wide a difference, so great a diversity of demand to be filled, that it seems to me we all of us should know something of the different types of internal-combustion engines such as are today an absolute war essential.

It is barely forty years ago that Dr. Otto perfected his first four-stroke-cycle, hot-tube ignition gas engine, with a plain slide valve similar to that used in steam engines from their birth to the present day. In the steam engine the inlet and exhaust have to be opened at every revolution of the crank shaft. In Dr. Otto's engine the valves had to be opened once each alternate revolution, or once each four reciprocations or strokes of the piston, whence the name or appellation, four-stroke-cycle, as descriptive of the Otto cycle as applied to the gas engine.

From the stationary gas engine to the marine was but a step. Small bore and long stroke, features of the early stationary type, were soon abandoned, and about the present proportions of bore to stroke adopted. The hot-tube was superseded by electric ignition. Heavy flywheels were made lighter and smaller, the better to accommodate installation. Probably the adoption of electric ignition was the most important feature in the development of the automobile engine from the marine. Its weight was decreased and by increasing the speed, greater power became possible.

The reliability of the developed marine gas engine, and many of the features of the design of the automobile type, made possible the aeronautical, while the stationary and marine features combined, rendered possible the early submarine, now universally powered with four-stroke-cycle engines, except that they operate on heavy oil and on the Diesel principle, the high compression of air furnishing sufficient heat to completely ignite the heavy fuel sprayed into the cylinder after the air is compressed therein. The stationary gasolene electric generating sets are developed more from marine than any other types, while the tractor combines features of the marine, automobile and stationary types.

For automobile, motorcycle, tractor and aeronautical installations, the four-stroke-cycle seems the only type adaptable, while for smaller water craft such as are to be used close to shore and in sheltered waters, constructed usually in single or double-cylinder models, two-



Gregory in Midocean. Powered by Two 300-H.P. Standards

stroke-cycle engines are largely employed when low speed is permissible. For boats to be driven at moderate or high speed, and whose length approximates say 30 feet, and up to the largest craft driven over or through the water, the four-stroke-cycle engine, propelled by gasolene, is by far the most reliable, dependable and economical in operation.

Owing to the fact that weight is no disadvantage in engines used for the two-fold purpose of propulsion of submarines and the charging of the accumulators or storage batteries with which such craft are equipped and which are used for propulsion when submerged, Diesel engines are almost exclusively used. So far as I have been able to learn no semi-Diesel engines, or true Diesels operating on the two-stroke-cycle, have ever been used in submarines, notwithstanding the fact that there are engineers who claim that two-stroke-cycle Diesels and both two and four-stroke-cycle semi-Diesels could be used advantageously.

For portable electric lighting, wireless and similar purposes the four-stroke-cycle is undoubtedly better than the two-stroke-cycle, if for no other reason than its manifestly greater fuel economy.

Owing to the low price of gasolene which formerly prevailed, much greater attention was paid years ago to dependability and reliability, than to fuel economy, in the design and construction of marine gas engines. With the demand for larger and larger units, and the soaring price of gasolene, more and more attention has been paid to the matter of fuel economy at both full and part load. Many consumption tests have demonstrated one fact beyond any argument, and that is that the greatest fuel economy is within quite narrow limits of speed, and that an engine operating at approximately one-half the speed at which it shows greatest fuel economy, will be found exceedingly wasteful of high-priced gasolene. For best results a marine engine should be operated at full throttle and as nearly as possible at the speed at which the manufacturer guarantees least consumption of fuel per horsepower per hour.

The vital difference between the operation of a steam and a gas engine is that in the former any increase in the boiler pressure results in correspondingly greater power with the same throttle opening and in partly closing the throttle just so much power is saved as is not used in the engine, the amount of heat utilized for the generation of steam in the boiler being correspondingly reduced, else the power will be wasted through the safety valve, while in the gas engine the power is generated in the combustion chamber from explosions of air and gasolene vapor, more or less intimately mixed, and in proportions varying with the throttle opening, speed of rotation and amount of compression at the time of ignition. Of course there are other conditions to affect fuel efficiency, but in the main these three are the most important.

The United States Naval Coast Defense Reserve will eventually have a varied assortment of gasolene engined craft propelled by engines of different types, for the most part yachts driven by high speed engines whose design savors much of that of automobile types. The submarine chasers already contracted for and to be built by the Naval authorities, I understand will be driven by engines of much slower rotative speed, but the motive power should be more reliable and dependable in rough weather when these qualities are most needed, due to the fact that such engines are designed for long hard



Abiel Abbott Low, First Power Boat to Cross the Atlantic, Equipped With 10-H.P. Kerosene Engine

grinds with no necessity for ultra light weight reciprocating pistons and connecting rods, with all parts needing attention easily get-at-able, and their operation more easily understood. The time they will be absent from their regular stations and scouting work, as a result of engine trouble, will not be a tithe of what can reasonably be expected from highly developed engines of rather fragile construction, when compared with heavy duty engines, when subjected to heavier duty than ever before called for—protecting the coast of the United States of America against submarine menace.

The real birth of the gasolene scout cruiser and the submarine chaser, was late in 1904, when THE RUDDER offered a cup for the first long-distance power-boat race from College Point, N. Y., to Marblehead, Mass. The christening occurred during that never-to-be-forgotten run through the seething waters across Nantucket Shoals in a nasty Southeaster, while the Regatta Committee waited on the Ramona, anchored in Marblehead Harbor, fearing disaster and death to the competing crews. What a relief it was to the weary watchers when little Talisman hove in sight. When later we saw her started deckhouse and the exhausted condition of her crew, our fears for the others were by no means allayed, and a prayer of deep thankfulness was said when the last boat with her crew was reported safe.



Detroit Off on Her Long Voyage, Driven by 17-H.P. Scripps

Early in 1905 the destroyer Gregory, built for the Russian Navy, crossed the Atlantic, being the first boat equipped with a gasolene engine to accomplish this feat, only to be exceeded a few years later by Detroit on her wonderful run from Detroit to Petrograd, then St. Petersburg.

Submarines have two methods of propulsion, internal-combustion engines, gasolene or oil, and electrical engines. For running with the periscope extending above the water, with decks just awash, or with water ballast entirely out, the internal-combustion engine is used. The engine is also used for charging the accumulators, or storage batteries, as they are more commonly called, for driving the boat by means of the electric motor when submerged.

This condition necessitates a cutoff coupling to permit the engine to be run without driving the propeller, as for charging the batteries, also so that the engine crank shaft will not be rotated when running by the electric motor. Means also has to be provided when a solid propeller is used which will allow the motor armature shaft to revolve much more rapidly than the propeller shaft in order to get sufficient power from the electric motor. In the early development of the submarine driven by gasolene engines only, reversing propellers were used. By reducing the pitch of the blades there would be less resistance so that when driving by electricity the propeller shaft could revolve much more rapidly than when operating the engine with the blades adjusted to maximum pitch.

When running submerged for any length of time the electric energy dissipated in the form of heat through the engine makes life barely endurable for those in the engine room.

Diesel engines, such as are used for propelling submarines, are extremely susceptible to "scored" cylinders, which render them ineffective. On account of the high compression which may reach 600 lb or more, or eight times that normally employed in marine or automobile gas engines, any slight valve leak, either inlet or exhaust, will have a serious effect upon the engine's efficiency.

Semi-Diesel or hot ball surface combustion engines employ only about half the compression of that of the true Diesel type, and are consequently less liable to leak losses through defective valves.

One American manufacturer of Diesel engines employs an over-running exhaust to overcome the tendency to leaks beneath the exhaust valves. There is a port in the wall of each cylinder, which is uncovered by the piston before it reaches its lowest point. When this port is uncovered, an auxiliary exhaust valve, already open, permits most of the exhaust gas to escape. This valve closes after the piston reaches the end of the power stroke and after the main exhaust valve has opened. This over-running exhaust construction was employed in early model Franklin air-cooled automobile engines. So far as I have been able to learn, no other Diesel manufacturer has adopted this feature, which has proven so far a valuable one.

It is necessary to use electric propulsion when submerged for two reasons, first because the pressure of water through the exhaust would "stall" the engine, and second the air to mix with the gasolene vapor would soon be exhausted, it being impracticable to carry sufficient air, compressed to the limit, to supply that for the respiration of the boat's crew and the engine's requirements as well.

The storage batteries in use are of similar type to those used for starting automobile engines, but of course they are very much larger. Alkaline type batteries were tried on one submarine, but with disastrous results, a bad explosion following a test discharge of the battery while the submarine was being overhauled in dry dock. The cause of the accident, as generally ascribed, was that one of the cells had become discharged, and the current from the remaining cells in the circuit reversed the current through this cell and charged it, which charging generated hydrogen gas in excessive quantity, becoming highly explosive when mixed with the oxygen of the air, and was accidentally ignited.

The army mule, whose duty but a few years ago was multitudinous, hauling camp impedimenta, ambulances, and even carrying mountain artillery on its back, and in emergency providing food, has gone, and in its place has come the automobile in both its types, pleasure and commercial.

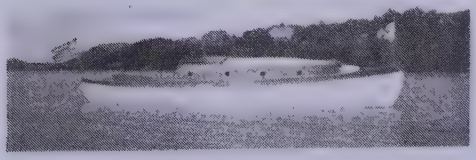
It was automobiles which saved Paris early in the war following the invasion of France.

Automobiles of American design and construction, supplement the railroads of France in transporting men and materials to the front. American gasolene-driven ambulances bear their ghastly burdens of human suffering from the fields of battle, through shot and shell, to receive earlier surgical attention than otherwise were possible, saving millions from torture, from lingering horrible death.

Early in the American automobile industry many French and other foreign-made automobiles were imported and used on our then wretched roads. In Europe, with her fine highways, they gave excellent service but our roads were too much for foreign cars. The fact was generally recognized in the industry that American automobiles would have to be designed and manufactured to meet the then present American road conditions —and they were. France, England, Russia and Italy may today give thanks for the ruggedness of construction of American-made automobiles, which have given better service than those produced in any other country.

It is safe to say, that, with the present conditions of the shot-and-shell-torn roadways of Central Europe, the sun of victory would long ago have set for the Entente Allies but for the American kind of automobile, designed and constructed for hard service.

The American automobile engine, for war purposes, quite fills the bill. It is well to note, however, that so far as I have been able to learn not a single six-cylinder car, either pleasure or commercial, has been purchased in this country for war purposes. Just why is easy to



Talisman, Winner of First Marblehead Race, Fitted With a 10-H.P. Murray & Tregurtha Engine

explain. A four-cylinder moderate powered automobile engine is much more economical in gasolene than a high-powered six-cylinder, the somewhat greater speed flexibility of the latter being more than compensated by the greater fuel economy of the former.

The automobile gasolene engines demanded are manufactured in lots of hundreds and thousands. Their life is necessarily short. They are good enough for the purpose, and in case of a breakdown or serious accident they can be left beside the road.

In an automobile, quite unlike a power boat in a storm with a lee shore and "nigger heads" showing in the surf line, a breakdown or even the "stalling" of an automobile engine may not be accompanied by danger of fatal shipwreck, as might happen to a boat's occupants.

The aeronautical engine, for perfect operation, has one feature in common with the marine type. It is practically always, as is the marine engine, driven at full power, while the automobile engine is operated with full throttle only a small fraction of the time.

Aeronautical engines are either reciprocating, like the usual marine or automobile engine, or they may have stationary non-revolving crank shafts, with nine cylinders each revolving about them, the propeller shafts being gear driven through small pinion gears engaging internal gears attached to the crank shaft housings rotating with the cylinders to which they are attached.

In this construction, which will be recognized as the "Gnome" engine, and which is being manufactured extensively in this country under French license, the air and gas is taken into the enclosed crank case and thence into each alternate cylinder through valves in the heads of the pistons. One of the peculiarities of this type of engine is that the only oil which possesses sufficient viscosity or thickness under the extreme heat, is cold pressed or medicinal castor oil. It is said that the cost of the castor oil used for lubrication is much greater than that of gasolene.

Our doughty and plucky American aviatrix, Miss Ruth Law, who has just returned from the battlefront in France, where she has investigated the war airplane in action, to offer her services in defense of her country, is reported to have said in an interview that American airplanes are inferior to British made, being much slower, and that American airplanes use but a single engine while English makes have two. If such is the case her suggestion that English designs and specifications should be adopted here, that the American aviation branch of war preparedness might be strengthened, should be followed. We want not only the best but the very best, and we want a plenty—too many rather than too few.

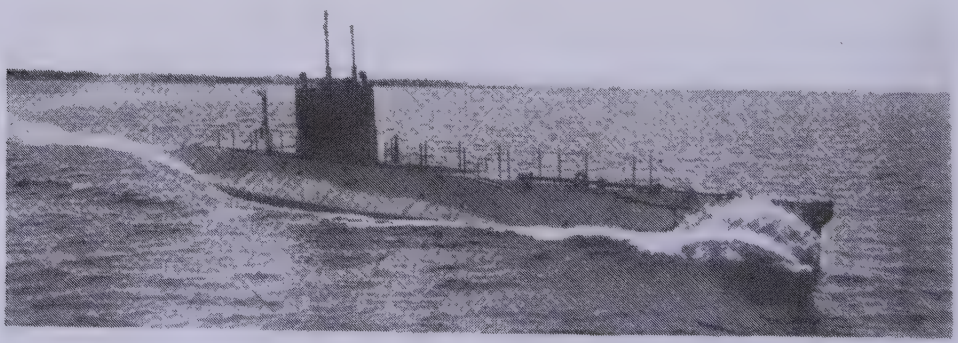
The gas engine industry of the United States is today in a highly prosperous condition. The automobile manufacturers were never in better shape to furnish both pleasure and commercial vehicles. Their production and engineering organizations are fully completed and coordinated.

The same condition exists among the manufacturers of marine gas engines who are equipped to manufacture large units, which are in especially heavy demand at this time. One manufacturer turned out, in a period of 535 days, a total of 1,100 engines of 220 h.p. each for Great Britain alone.

Another manufacturer of marine gas engines has produced a large number of aeronautical engines, which have been shipped to Canada and have eventually found their way to the battlefields of France.

It was an American concern which developed the giant caterpillar tractors or "tanks," which spread terror and consternation not only on their very first but on every subsequent appearance before the enemy, crossing trenches and barbed-wire entanglements even as furrows in a ploughed field, dealing out death and destruction as they drove straight ahead.

I have full faith in American arms and in American gold, to prosecute to victory the war recently thrust upon us, but I believe fully and confidently, that any slighting of the internal-combustion engine, any shortage of automobiles for transport, of power boats for scout and dispatch service, of air and water planes for aerial observation and defense, of "tanks" to accompany our army of invasion, of submarines for coast defense and for offensive purposes as well, or of field generating sets for wireless and searchlights, will be a crime of omission, inexcusable and unpardonable. We have the factories, the material and the men to produce. Let it never be said that America failed to provide—a vital power for war in quantity insufficient or in qaulity aught but the best.



U. S. Submarine of the K Class, Built by the Electric Boat Company, and Driven by Nelseco Diesel Engines

Yachtsmen Enrolling for Defense

MORE than 1,200 yachts have been offered to the Government for service in the Naval Coast Reserve. These boats vary in size from the large steam yacht down to the power yacht of 40 feet length. The work of tabulating these boats has been a tremendous one. It has been done by a Committee of which Commodore Robert E. Tod is chairman and he has devoted nearly all of his time to the work.

Some owners have donated their vessels unconditionally to the service, others have offered to sell at moderate prices, others have offered their boats for charter under many different conditions, and a few have fancied that they had an opportunity to get rid of their boats and at the same time make some money by asking fancy prices.

This huge fleet of vessels is scattered all over the country and inspectors are now busy looking them over to find out if they are adapted for the work to which they will be put, and to find out just what will have to be done to strengthen them so that they can mount guns This is another long task but the inspectors are hustling and boats are being accepted or rejected each day. As soon as a boat is accepted, if it requires strengthening it is sent to some yard where the work can be done well under the supervision of Naval Constructors.

At Morris Heights the Kanawha, Gem, Tarantula, Sabalo and Marie are among the yachts being fitted. The Corsair and other large vessels are at Fletcher's, and so one might go on enumerating all the yards in the country and name vessels that are being rushed for the coast defense work.

The yachtsman will furnish the first line of coast defense and the yachting fleet will for a long time be the only vessels on this line, and they will be strengthened by such vessels as tugs, fishermen and small commercial vessels well adapted to the service.

The huge fleet of coast patrol vessels will be manned almost exclusively by yachtsmen and by yacht sailors. Among those yachtsmen who have enrolled, taken examinations and received commissions or grades are Vincent Astor, ensign; W. H. Vanderbilt, quartermaster; Harold S. Vanderbilt, lieutenant; Oliver Iselin, Jr., quartermaster, second class; Griswold Lorillard, of Tuxedo, coxswain; J. S. Morgan, ensign; Bradford Norman, Jr., quartermaster, first class; Richard D. Sears, Jr., Boston, electrician; William Winthrop Aldrich, son of the late Senator Aldrich of Rhode Island, lieutenant junior; William Sturgis, Jr., of Harvard, quartermaster, first class; Fred B. Thurber, of Providence, lieutenant; William John Caner, of Philadelphia, quartermaster, third class; Henry Graff Trevor, Jr., of Harvard, quartermaster, third class; Walter Wyckoff Brinkerhoff, lieutenant, junior grade; Steuart Davis, lieutenant commander; Maurice Eppley, of Princeton, lieutenant commander; E. Howard Reid, lieutenant; F. P. Humphreys, lieutenant; Orson D. Munn, New York, lieutenant. Others are Robert E. Tod, Gherardi Davis, R. B. Roosevelt, Paul Hammond, Stuyvesant Wainwright, Clinton McKenzie, Henry Hayes, Edwin Gould, A. R. Whitney, Jr., Johnston de Forest, Albert Strauss, Walden Pell, Nelson Burr, William Appleton and H. S. Beardsley.

It will be a long time before the new patrol boats are ready and some are optimistic enough to think that by the time they are ready the war will be over, or at least the Germans will be so badly crippled that they will not be able to make any attacks on the American coast-line. Every one hopes that these optimists may be right in their prognostications, but even if they are the work of preparedness must go on, for there is no telling what the future has for us.

While the vessels for the coast patrol fleet are being got ready the work of enrolling yachtsmen and others is going on briskly. Several yachtsmen who have offered their boats and had them accepted, have received commissions such as lieutenant junior grade, ensigns and in a few instances lieutenancies. To get these rankings they had to show that they were qualified and pass examinations at the Navy yards. Some who have been studying since last Summer have done exceedingly well in these examinations while others who were thought to



110-Foot Patrol Boat, Building at Herreshoffs' for Robert B. Tod, A. I. Du Pont, Payne Whitney, H. S. Vanderbilt, and Two Others. To Make 25 Miles an Hour

be competent have failed and will serve as seamen on the vessels. It is rather singular that some who were thought to have been competent have failed in these examinations, and in some instances the men have shown that, while they are very competent as far as handling a small boat goes, they lack knowledge of navigating, piloting, signaling, gunnery, and in that rare tact of being able to handle men. To command or even assist in the command of a patrol boat is a serious undertaking. To be serviceable the boat must be well handled and an incompetent officer might endanger the service and at the same time commit some error that would cause the loss of the boat and the lives of the men on board. Every day at the enrolling stations men offer their services and think that they are entitled to rank but a few questions put to them by the enrolling officers soon show them their weaknesses, and then they are urged to enroll and help to the best of their ability. A little practical experience will do wonders for many and this, together with some study, will enable them to earn promotion.

One enrolling officer who has had more experience than others recently jotted down a few suggestions that will put the matter of enrollment clearly before those who wish to serve. These are:

Commissions, Warrants and Ratings are "provisionally" given by enrolling officers in accordance with the case which each applicant makes in his own behalf.

Former discharges from naval service are viewed as proof of applicant's actual accomplishments and as a starting point of later acquirements.

Licenses, certificates, etc., are viewed as evidence of probabilities of an applicant's ability to perform the functions specified. Continued employment under such "tickets" are viewed as the establishment of the capacity expected of the holder. Testimonials from owners, and others in a position to judge, add value to record of service.

Non-professionals must fully realize all the responsibilities attaching to rank or rating. There remains no period of peace wherein one may learn, in practice maneuvers, the accomplishments expected of one in his station. Instead, a vessel or engine committed to his care may be put out of service, lives entrusted to his skill may be endangered or lost, or, the team work of a flotilla may be completely nullified by the incapacity of the officers or crew of any individual unit of the organization.

It should likewise be borne in mind that the rank or rating gained from the enrolling officer is by no means a permanent acquisition. It is no secured vantage point above those holding lower ranks or ratings. All are but provisional and, by law, confirmation can only be obtained by each individual proving to a board of three officers "not below the grade of lieutenant-commander" that he is *qualified* to fill the position provisionally allotted. When these tests are applied the outcome cannot but be that many who have taken lowly seats will be bidden to come higher while others will suffer the mortification described in the parable.

Altogether too much importance is attached in the public mind to the "submarine chaser". Only occasionally does an applicant offer his services unconditionally. Almost invariably these are specifically offered for "chasing submarines" or for duty in the "mosquito fleet". Too often this is followed by an inquiry as to the rank or rating he may obtain, although his experience may be of the slenderest or ofttimes negligible. None seem to take into the slightest account the configuration of the sea bottom along the major stretch of our Atlantic seaboard and apparently the war is to consist of smallish craft dashing merrily after U-boats like unto schools of porpoises. On the contrary there are a multitude of other and more important spheres of usefulness.

A favorite idea of securing the coveted end is to propose to be one to offer a boat together with the services of himself and some of his friends. Invariably, the slightest of questioning develops the fact that none of them ever had a signal flag in his hands, not one ever had a speaking acquaintance with a rapid fire or machine gun, most of them can run a gasolene engine when it is in a good humor, and the combined knowledge of night pilotage is about on a par with their practical knowledge of cooking. As a rule they disclaim ability to produce from among those they know a skilled man in each of the several lines of accomplishment necessary to a balanced crew.

An interesting development of the situation is the surprising numbers and the skilfulness of the amateur radio operators. Of course everyone knows that at every turn there can be seen unpretentious aerials which look to be the plaything of some boy with a temporary bent towards wireless telegraphy, but when occasion serves to investigate their accomplismments the findings are truly astonishing.

A regrettable feature is the lack of qualified aviators. Many ask for a chance to be taught but few can make claims to any experience either as pilots or as airplane mechanics, and yet both are greatly needed.

For the good of the cause and in behalf of those who would serve, all rosiness should be toned out of the publicity. A volunteer who cannot face the facts, as they cannot but be found, is not going to be of value. One who can face them, and comes in undeceived, approaches these facts in a frame of mind which goes a long, long way towards minimizing them.

War is not a Summer diversion, even while the British fleet lies between Heligoland and the Third Naval District of the good old U. S. A. Uniforms and titles do not make a Navy but, if the enemy will not seriously molest us, we may yet prepare, during the coming mild weather, a force which has a decent start to face the Winter that may still find us guarding the approaches to our ports and their hinterland.

The power boat has shown that it is wonderfully efficient as a means of defense and the power yachtsman has also shown that he, too, is efficient. In handling his boat when cruising during the Summer and sometimes Winter months he has learned from practical experience how to handle it, how to navigate, and then, having had a taste of nautical matters, he has gone further and studied in order to fit himself for just such an emergency as has arisen. The work done by the members of the United States Power Squadron has been very helpful and the members of that squadron are showing now what they have learned, and they will on the defense boats give practical illustrations of their efficiency.



Lynx, 89-Foot Patrol Boat, Owned by Nathaniel Ayer, Jr.; Designed by Swasey; Built by Lawley; Two Sterling Engines; Speed 25 M.P.H.

Big Season on Barnegat Bay

By J. Kinzer Shell, Jr.

THE best racing schedule for sailboats and power craft during the four years of competition of the Barnegat Bay Y. R. A. has recently been completed by the regatta committee of the Association, headed by Commodore George Irving Merrill, of the Seaside Park Y. C. The Barnegat Bay sailors, both men and women, have extended themselves in arranging for this season's racing and plan to cooperate with the yachtsmen who are affiliated with the South Jersey Y. R. A. The delagates of the five clubs making up the Barnegat Bay Association have arranged for thirty-five events for power boats of the several classes and the one-design sneak-boxes and the leeboard sloops, to be held over the courses of the five clubs, during the eleven weeks of racing from Saturday, June 30th to Monday, September 3d. Twelve of the events will be for the various classes of power boats. Three special events have been arranged for the sailboats of the one-design class and the leeboard sloops.

Four years ago, five of the several clubs on the waters of Barnegat Bay from Bay Head to the North to Island Heights, formed an association, which since has been governing interclub sailboat and power-boat competition. During the first season of the Association an invitation was extended to the yachtsmen holding membership in the Atlantic City Y. C. and through the efforts of Dr Talbot Reed, then chairman of the regatta committee of the Atlantic City club, the club paid a visit to Barnegat Bay and the yachts participated in the first annual power-boat championships of Barnegat Bay held over the course of the Seaside Park Y. C.

Since the inception of outside boats in the races the interest has advanced and last year the South Jersey Association, through Dr. Reed, set aside the third annual Barnegat Bay championships as one of their features. The South Jersey yachtsmen responded to these events and two weeks later competed in the first annual New Jersey State championships at Island Heights.

As a result of the visit paid by the South Jersey Association to Barnegat Bay last season, and taking part in the championship regatta, the Barnegat Bay folks in a manner returned the courtesy by sending a fleet of six one-design sneak-boxes to Atlantic City to compete against a similar number of catboats of the Atlantic City Y. C. From this race, which was a clean sweep for the Barnegat Bay skippers, all of whom were of the fairer sex, the regatta committee of the Atlantic City Y. C. got the idea of holding interassociation sailboat contests for the one-designers in conjunction with the championship power-boat race-meets. The Atlantic City folks are building a fleet of one-design sneak-boxes so that there will be races for that class of boats as well as the catboats of the one-design type in the Barnegat Bay Association championships.

Since the South Jersey folks intend to compete in the fourth annual Barnegat Bay Association power-boat regatta on the second Saturday in August, the Barnegat Bay skippers are going to make the event more interesting by sending a fleet of boats from the five clubs to participate in the opening championship race-meet of the South Jersey Y. R. A. over the course of the Atlantic City Y. C. on Saturday, July 7th. This is the first time in the history of power-boat racing along the Jersey Coast from Bay Head to Cape May that power boats of the various classes of the two associations have gotten together over a course of one of the South Jersey Coast clubs. As an incentive for the boats to turn out in large number the six events for power boats will be sanctioned by the A. P. B. A. and championship certificates awarded to each winner. Added to the half a dozen power-boat contests will be the two special events for sailboats between the two associations.

Not alone will the sailors of the clubs interested in the game be competitors in the races finally settled upon, but the girls of the several clubs will take a turn at the tiller and the ropes and give the older but no keener followers of the game a chance to display their skill. Seven events, including the two special events in conjunction with the race-meets, will be held for the girls for the one-design catboats. Time and again have the girls of the two associations displayed their superiority over those who have followed the game for a long time and are becoming very adept at the game.

The Barnegat Bay yachtsmen have always been strong advocates of sailboat competition. In spite of the rapid advancement of the several classes of power boats the sailors of the association continue to display interest in sailboat racing and have arranged more than the usual number of events for the Summer. There will not alone be races for the one-designers on the point system, but arrangements are being made for the holding of a race of interassociation character.

Twenty-three events have been scheduled for the sailboats. Seven will be for men to be held on the point system, seven for the women of the five clubs, the annual race for the Schermerhorn Cup for leeboard sloops, and two championship races for the Morgan and Sewell cups, and four open events.

One of the features of the sailboat competition will be the races of the sneak-boxes of the one-design class for the title of Barnegat Bay on the point system. Each of the five clubs will enter the entire fleet of boats in each point race. The boats are awarded points according to the number of boats entering the contest and the number of boats each craft defeats. Bay Head has in past years and for the first time for the point system last season, cleaned up in the series.

It is understood at the present time that at least three leeboard sloops, which will be built for members of the Atlantic City Y. C., will be ready in time for the contest for the Schermerhorn Cup, which will be held, as has been the case for the last two years, over the course of the Island Heights Y. C. The Island Heighters, through Dr. Al. Mulford, the former Penn football star, has been able to take the Cup home or keep it at the club quite frequently. The sloop I. H. Y. C. has been a victor in the last three races, and it was through the daringness and knowledge of sailboat competition on the part of Dr. Mulford and his able crew, that the I. H. Y. C. was able to win three successive times. In the last seven starts she has won six times, having been defeated in 1911 by the Edith of Ocean City.

The schedule as arranged is as follows:

Saturday, June 30th.—Bay Head, Men's open sneak-box.

Wednesday, July 4th.—Seaside Park. Men's (first point) sneak-box. Ladies' sneak-box.

Friday, July 6th, Saturday July 7th.—Atlantic City fleet run of Barnegat Bay Y. R. A.; at Atlantic City regatta of South Jersey Y. R. A. power-boat championships, sneak-box and catboats.

Saturday, July 14th.—Mantoloking. Men's (second point) sneak-box.

Saturday, July 21st.—Island Heights. Morgan Cup race, Men's (third point) sneak-box. Ladies' sneak-box.

Saturday, July 28th.—Lavalette. Men's open sneak-box.

Saturday, August 4th.—Bay Head. Men's (fourth point) sneak-box. Ladies' sneak-box.

Saturday, August 11th.—Seaside Park. Men's open sneak-box. Sewell cup race. Special ladies' sneak-box. Sanction power-boat championships and special sneak and open sailboat events.

Saturday, August 18th.—Island Heights. Men's (fifth point) sneak-box. New Jersey State power-boat championships, special sneak-box and catboat events.

Saturday, August 25th.—Seaside Park. Men's (sixth point) sneak-box.

Saturday, September 1st.—Mantoloking. Men's (seventh point and final) sneak-box. Ladies' sneak-box.

Monday, September 3d.—Bay Head. Men's open sneak-box.

Heavy-Oil Yacht for F. E. Lewis

ONE of the most unique boats now building is for Frederick E. Lewis, 2d, of Northport. The craft is designed by and is now well underway at the yards of the Luders Marine Construction Company. She is 145 feet over all, 21 feet wide, 8½ feet draught, and will have a displacement of something over 300 tons.

The primary object aimed for in the designing of this boat was a vessel that would have great cruising radius. A tank space of 6,500 gallons has been provided, which will permit, at a speed of about 11 knots, of about 4,500 miles. This will permit of a contemplated cruise to Honolulu. Bearing in mind the conditions to be met in a voyage of this length, great consideration was given to making the boat comfortable for a trip of this duration.

A Sperry gyroscope, electrically driven, is in the hold. The function of this instrument is to prevent, or rather to anticipate, the rolling of the vessel. It is expected that a roll that might amount to 20° normally will be extinguished to such an extent when the gyroscope is operating that only about 5° is anticipated.

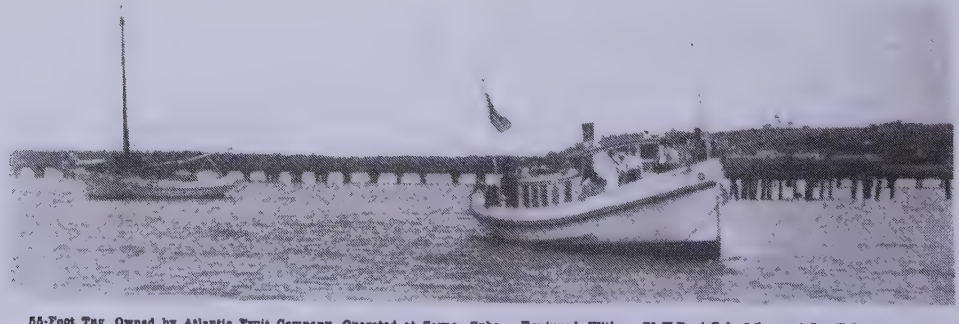
Bearing in mind that under certain conditions the forward or the after end of the boat might prove more acceptable in living conditions, the owner's staterooms have been arranged both forward of the machinery space and after. All told, there will be six staterooms and three toilet rooms, and both on the cabin deck. These quarters are isolated from the engine compartment by steel bulkheads made soundproof.

The staterooms will all be of a simple design, with little ornamentation. The forward staterooms will be finished in silver gray with metal work to match. The after quarters will be finished in white enamel rubbed to an egg-shell finish, with all trim, furniture and the like of genuine African mahogany.

A long deckhouse is located on the main deck and contains at its forward end a dining room about 16 feet long, which has a stairway to the owner's quarters below. The entrance to this dining room is through a vestibule communication with the main deck. The pantry is immediately aft of the dining room with a deck galley extending the full width of the cabinhouse.

The finish of the dining saloon will be in selected figured teak. An attractively carved teak sideboard will adorn the after end of this room. A large circular extension table in the center of the room is arranged to accommodate a considerable number. At the after end of this deckhouse will be a music room in which unusual effects in yacht decoration will be obtained, the decoration having been turned over to a firm of Japanese artists, who are expected to produce a piece of work both attractive and unique.

Opening on the after deck, but beyond a portion of the main deckhouse, is a large tearoom practically corresponding to a veranda at a country home. This will be arranged with luxuriantly upholstered divans and will afford a welcome observation point sheltered from inclement weather.



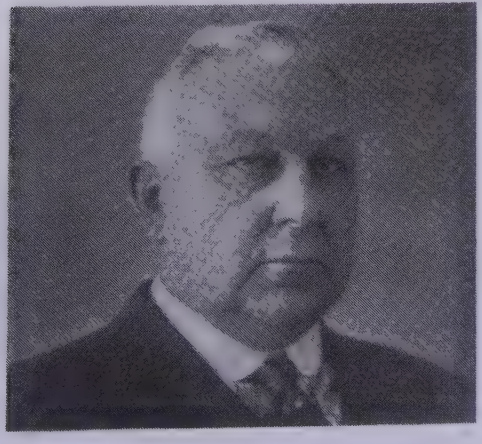
55-Foot Tug, Owned by Atlantic Fruit Company, Operated at Sarna, Cuba. Equipped With a 70-H.P. 4-Cyl. 8-In. x 9-In. Fulton Engine. It Tows a 60-Ton Barge 11 Miles an Hour

Rudder Staff on Naval Duty

SIX members of THE RUDDER staff are now in the service of the Government, working for the defense of their country. They are in the Naval Reserve, Fourth Class, and have various ranks. It is certainly a compliment to the ability of THE RUDDER staff that the Navy Department should have taken so many of its force and speaks volumes for the quality of the matter that has been printed in THE RUDDER columns, much of which has been furnished by those who are now in the service of the Navy.

Fred W. Goeller, Jr., well known as the designing editor of THE RUDDER, is a lieutenant, j. g., and is superintending the work being done at the yard of the Gas Engine & Power Company at Morris Heights, where many yachts are being fitted as patrol boats. Charles Desmond, who has written articles on designing, one of which series is now running through THE RUDDER, is also a lieutenant and watching work done on the patrol fleet. A. E. Potter, the engine expert of THE RUDDER staff, has similar rank and is now to be an expert on engines for the Navy. Charles G. Davis and Roger M. Haddock, contributing editors, and both of whom had agreed to furnish a series of articles, are on the construction staff as lieutenants. Mr. Haddock is watching things at a yard East and Mr. Davis is inspecting boats on the Lakes. Grafton B. Fish, who wrote articles on navigation, is enrolled as an ensign and is now on the steamship New York.

Naturally such a depletion of the staff has put much work on the shoulders of those left and has seriously handicapped the editorial force. In spite of this, however, THE RUDDER will still maintain its high reputation and the quality of the matter published each month will improve with each publication, as it has in the past year under the present management.



Austin E. Potter, Engine Expert, Now Serving the Navy

Fred Goeller is known everywhere in yachting circles and his work has been watched with interest in the Navy Department. When help was wanted he was one of the first requested to lend assistance. He is known as a designer of small boats, but has turned out some power craft of moderate size. He was born in the Bronx in 1885 and he still lives in that Borough. He studied naval architecture in the New York Nautical College under George Crouse Cook, who is now in the Navy. Then for two years Mr. Goeller worked with the Union Iron Works, San Francisco, where he obtained much valuable experience in construction. On returning East he has worked with Charles D. Mower, Henry J. Gielow, and Tams, Lemoine & Crane as a designer and draftsman. Then he became ambitious and opened a yard in the Bronx in partnership with his brother and turned



F. W. Goeller, Jr., The Rudder's Designing Editor

out several creditable boats. In February, 1913, he joined THE RUDDER staff and has become an advisor to all RUDDER readers. Among his best known boats are the 31-rater Josephine; the Class R sloops Margaret, Joyetta, and Ilderim, Rosemary, a 60-foot power boat, the Hippocampus, Autan, a 58-foot schooner for Bermuda, and a 50-foot shoal draught tug for San Domingo. The last two are of this year's design.

Austin E. Potter is an authority on engines and is known everywhere in the engine building industry. He was one of the first manufacturers of the gasolene engine and appreciated from the start the immense value that engine would be for all uses. Among his friends he is known as "Bishop Potter" and his picture shows how well that title applies. Mr. Potter is not only an engine man, he is a thoroughly competent boat-handler and a very capable navigator, so that he will be of much value in his new field of usefulness.

Grafton B. Fish is a navigator. He was born in

New Bedford and from that old whaling town imbibed his fondness for the sea. He graduated at the New Bedford High School and later became an instructor in the New Bedford Industrial School. He attended Cushing Academy Prep. School at Ashburnham, Mass., and then entered New York University, where he took a four-year course in mechanical engineering. He made several trips to Cuba and South America in merchant vessels, serving as junior officer, and acted as navigator in some of the long-distance races, notably in the Eronel to Halifax. He joined THE RUDDER staff a year ago and now is a navigator on the American Line steamship, New York. Just before that vessel left for Liverpool on her last voyage he enrolled in the Navy with the rank of ensign. Navigation has been his hobby. He has spent



Ensign Grafton B. Fish, The Rudder's Authority on Navigation

all his spare time on the water and is a master of his subject.

Charles Desmond is well known as a naval architect of ability. He has conducted a school of naval architecture and some of the brightest of the younger designers have studied with him. His articles on designing which have been published in THE RUDDER have attracted attention all over the world.

Roger M. Haddock was born in New York City forty-seven years ago. He first worked with David Kirby, the boatbuilder, and afterwards with William Gardner. He did all the designing for the Schofield-Holden Machine Company, of Toronto, for five years. He has designed about one hundred and twenty boats, the best known of which are Whileaway, a 61-foot houseboat, the first



Roger M. Haddock, Who Writes Many Instructive Articles

gasolene-driven houseboat of its type; a 97-foot houseboat for McCoy Bros., of Florida; a 92-foot steamer for the Coquille Navigation Company, of Oregon; the Sagitta, an 85-footer with a speed of 28½ miles, and many yawls, catboats and one-design classes.

Charles G. Davis needs no introduction. Every yachtsman knows Charley, either through reading his articles and studying his sketches or through having met him in races and at clubs. He studied many years with William Gardner and even then when drafting plans he would embellish them with little thumbnail sketches. He has studied navigation at sea and has practical experience and has also had charge of some building yards. For many years he was on THE RUDDER staff, but in the past few years has been a contributor because outside interests took most of his time. At present he is manager of the American Boat Company's shops at Detroit.

Mr. Davis is not only a very capable designer and efficient constructor, but is one of the cleverest small-boat handlers in these waters. He is always in demand where an important series of races is to be sailed because of his ability to handle sails well and his thorough knowledge of tides.



Ferry Boat Madeline, 55 Ft. by 14 Ft. Powered With a 36-H.P. Model D-4 Gray-Prior Engine; Speed 8 M.P.H.



Sardine Boat Go-Get-Em, 47½ Ft. by 10 Ft., Driven by a 36-H.P. Gray-Prior Engine Operating on Kerosene; Speed 10 Miles

Lipton Cup for Class R

By Frank B. Wever

THE greatest boost in years for small yachts on the Great Lakes has been given by the Columbia Y. C. of Chicago, which has recently arranged that yachts of the Universal Rule R Class may race for the Sir Thomas Lipton Competitive Cup, in place of the old 21-footers. At a meeting of the Lake Michigan Yachting Association, held recently, August 23d, 24th and 25th were selected as suitable dates for the regatta for the Lipton Cup.

Definite information has been received by the Chicago Y. C. that seven yachts will race for the Cup. These are: Pam—1916 Interlake champion, Clarice and Mebleh, of Cleveland Y. C.; South Shore, of South Shore Y. C., Milwaukee; and Maia and two new yachts building, of the Lincoln Park Y. C. of Chicago. There are others in sight too. The R Class yacht is the best all-around Universal Rule boat on the Lakes.

The Lipton Cup stands 39 inches in height, and is valued at $4,000. The trophy is in the form of a vase, having for handles two finely moulded figures holding in one hand a wreath of laurel and in the other a palm branch, representative of "Victory" and "Good Will." The lid is surmounted by a trophy composed of four prows of Roman galleys supporting a globe with an American Eagle above all.

The front of the Cup has a panel surrounded by a laurel wreath, water lilies, etc., with a representation of two racing yachts in full sail, executed in bold relief. The reverse has a similar panel containing the Shield of the United States enameled in proper colors, and surrounded by a wreath of laurel. The stem and foot are decorated with water plants and laurel, the lower band bearing the following inscription: "Sir Thomas J. Lipton Competitive Cup, Instituted 1902."

The pedestal is of ebonized wood, having at each end a solid silver, finely modeled, winged horse, indicative of "Speed," with a panel on one side having the flag of the Club in enamel surrounded by the words "Columbia Yacht Club, Chicago," and a similar panel on the reverse side with the arms of Chicago enameled in proper colors. The lower portion of the pedestal has a silver band divided into spaces one inch high and three inches wide for engraving the names of the winners from year to year.

The Cup was presented for the purpose of encouraging yachting on the Great Lakes of America and especially in the way of friendly contest in sailing and seamanship.

Any yacht of the Universal Rule R Class, regularly enrolled in a yacht club, belonging to an Association, which Association is a member in good standing of the Yacht Racing Union of the Great Lakes, has the right to compete without time allowance, provided notice of entry shall be filed with the Secretary of the Columbia Y. C. of Chicago ten days before the date set for the first race.

The races will be sailed off the port of Chicago, the courses being 12 nautical miles each; the first race over an equilateral triangle, twice around; the second race to windward or leeward and return, twice around; and the third race over a quadrangular course measuring 12 nautical miles once around.

The yacht making the best record in the three races will win the prize and the club in which the yacht is enrolled will hold the Cup until the first day of June the next year, when it must be delivered to the Columbia Y. C. of Chicago.

The races are to be governed by the rules of the Columbia Y. C., which are practically the same as those of the Lake Michigan Yachting Association, which in turn are almost identical with those of the Yacht Racing Union of the Great Lakes.

A gold medal will be given to the owner of winning yacht by the Columbia Y. C. Each member of the winning crew will receive an appropriate souvenir and like recognition will go to the owner of each yacht finishing second, third and fourth in the series.

The officers of the Columbia Y. C. are: Commodore, C. H. Morgan; vice-commodore, H. D. Moreland; rear-commodore, D. W. MacDonald; secretary, Frank B. Wever; treasurer, M. J. Bates; directors, F. D. Porter, H. L. Diehl, J. F. McGuire; regatta committee, E. J. Conlan, chairman; J. J. Coyne, M. J. Bates.

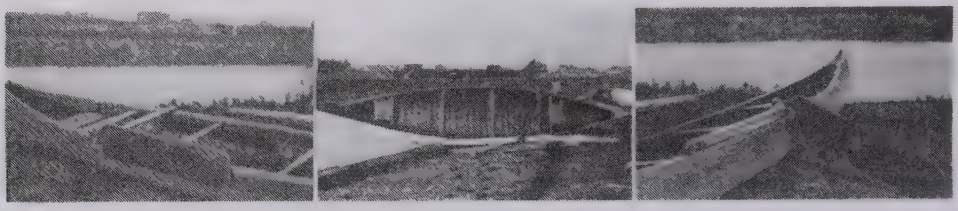


Lipton Cup for Class R Sloops

Canoe Sailing to Be Popular

By Perry Vosseler

IT is possible that yachting will be seriously interfered with this Summer. With the country at war and all the steam and power yachts enrolled for defensive work, there will be little cruising in vessels of this type and as a large number of yachtsmen have volunteered for work on the patrol vessels the larger sailing craft will not be commissioned. There will, however, be some yachting with small boats and these will be used in harbors, on rivers and lakes. With the yachts out of commission many will turn their attention to the canoe for amusement. Even in times of peace the canoe is wonderfully popular on all small pieces of water, particularly on the New England lakes, and this year the outlook is exceedingly bright for canoeing.



Views of a Canoe Showing Interior and Leeboard Arrangement

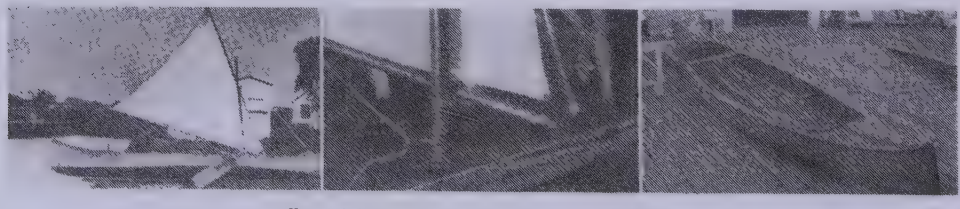
With the coming of Spring the canoeist turns his thought to the Summertime when he lazily sails or more energetically paddles, and fitting-out time for these boats is at hand. It is very possible that many who are devoted to sailing small yachts will turn their attention this year to sailing canoes, and even if they cannot secure a sailing canoe they can easily transform a paddle canoe into a sailing craft.

The ordinary canvas canoe, of which there are many thousands in use, can be easily equipped for sailing and when so equipped will beat to windward and, speaking in a general way, will behave under sail just as well as any small craft.

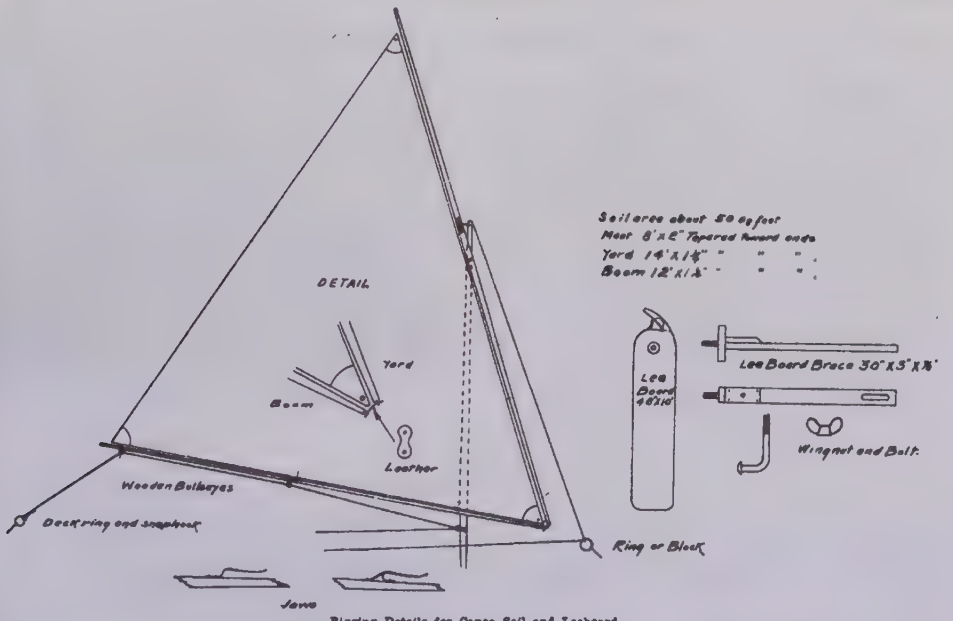
The rig shown in the sketches has been developed in the American Canoe Association and proven to be the best by many years' racing. The single leeboard is as effective and more convenient than double boards and the pattern shown is the simplest of the many arrangements devised for this purpose. The mast should be placed just aft of the bow seat, its exact location not being of importance, and the leeboard brace should cross 15 or 18 inches aft of the mast. The exact position of this is found by a trial trip or two and marked. No rudder is needed, steering being done with a paddle, though ex-



Canoe Under Sail and Showing Relative Size of Rig



Views of Sailing Canoe and Mast and Spar Arrangement



Rigging Details for Canoe Sail and Leeboard

cept when maneuvering most of the steering is done by shifting the crew's weight and trimming the sheet. To tack the crew moves forward, trimming the sheet at the same time, and just a touch of the paddle brings the wind on the other bow.

Those who undertake this sport will be surprised at the facility with which the canoe can be managed under sail and will obtain from the simple, quickly adjusted rig many hours of pleasure from their canoe which might not otherwise be had.

New Launch for the President

THIS Summer President Wilson will have the use of a new mahogany tender which has recently been built by Hehre & Auer, of Clason Point, Bronx, for the Navy Department and to be used with the yacht Sylph. This would indicate, too, that the President's yacht Mayflower is to be put to more serious work, as it was when first purchased by the Government at the time of the war with Spain, nineteen years ago. The new launch after successful trials was shipped to Washington.

The tender is 25 feet long, by 5 feet 11 inches breadth, and is of the V-bottom type, designed by Alfred and Charles Crouch. She is unique in having a double skin of mahogany, the outer skin being 5/16-inch thick and the inner of 3/16 inch, copper fastened to the outer skin, as your wife would term it, "on the bias," and also copper fastened to ⅝ by ⅝-inch oak ribs. The high cost of copper was not considered at all, for there is also a plenitude of bronze trimmings and fittings, polished and shining, though gold in many places would have answered as well and been a mighty sight easier to keep clean. Mrs. Wilson will not have to do the polishing, however.

The cockpit has a lazy-back leather-covered seat fore-and-aft, and two wicker chairs with leather cushions. It is roomy enough to carry ten or twelve passengers by using folding seats. It is covered with the Navy type khaki top with side curtains, giving full standing room.

Forward of the bulkhead is the engine compartment, with seat for the crew of two, upholstered in leather. In front of this is a typical auto dash with dials and controls.

The power plant, located well forward under folding hatches, is a Wisconsin engine, four-cylinder, four-cycle, each cylinder being 5.1 by 5.5 inches, rated at 58 h.p. at 1,200 r.p.m. It is equipped with a Leece-Neville double-unit starting, lighting and ignition system. Gas is fed under pressure from the bow tank, pressure being supplied by pump attached to the engine. The controls are mounted on the auto-type steering wheel and pressure gauge, button for the Klaxon electric horn and

switch for the lights are on the dash, which bears on the reverse side the cutout and regulator devices, fuse blocks, etc.

A speed test, witnessed by a "hull passel" of admirals, rear-admirals, captains, lieutenants, ensigns and plain inspectors, saw the craft go over a measured course of 11 knot in about a 19-mile (statute) per hour gait. The distance was covered twice in 4 minutes 7 seconds and 4 minutes 9 seconds flat. This being far above the requirement, she was accepted at once.

The picture shows the tender coming up Pugsley's Creek toward the boatyard with George Auer at the wheel. You will see he has a broad smile on his face, for it is the first time he ever rode in a President's boat. When George started out it was his own, but before he returned the boat belonged to his Uncle Samuel. All George had was some fellow's promise to pay for it when the red tape has been cut. Just the same the President is getting a dandy little boat for our money, and Clason Point is all stuck up about him getting it there.



Launch for Yacht Sylph on Trial Trip

The Passing of Aunt Kate

By Hi Sibley

AUNT KATE is no more! Let us drop a tear—two tears. I could do so with great sincerity, for some of my happiest days were spent in her dear company. And then again, there are times when I could have witnessed her passing with sardonic glee, for Aunt Kate, it grieves me to state, could be a most perverse and trying creature. And often she was just that, to a shocking degree.

But the capricious old lady is gone now; what bitterness we may have once harbored against her has been softened by the kindly hand of time. Six years have passed since she proudly sailed the main and memories of her are fond indeed.

Aunt Kate, be it known, was a houseboat; a squat, pudgy, wilful little hencoop of a houseboat, with about as much freeboard as a dinner plate and speed—Oh say! —an Erie Canal lumber barge was a greyhound in comparison. She became widely notorious for her playful pranks and it was a rare week indeed that she did not take at least one dip beneath the choppy waves of Lake Chapin.

But we could not hold that against her, for Aunt Kate



Ready to Start
Her Crew

Showing the Pontoons
In Buccaneer Traffic

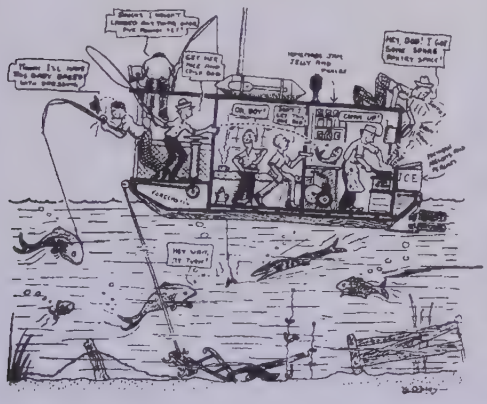
Launched at Last
Showing Steering Gear

After Freeboard was Raised
A "Close Up"

herself was not entirely to blame. She was hardly what one could call a eugenic offspring, and when she came into the world she was handicapped with about as many nautical afflictions as a ship could have and not expire on the spot. Yet, with characteristic stubbornness Aunt Kate survived, and what is more, she performed in a manner that would have shamed a normal and far sturdier craft.

You see, her design was the product of about nineteen embryo naval architects. None had ever built a boat before and if one could have boiled down this symposium of marine ingenuity there wouldn't have been enough practicable ideas left to caulk a fire bucket. But we builded with the unshaken faith of a Noah, and when the last triumphant touch had been added, we were proud indeed of our resplendent white ship.

Our pride, however, went up in spray soon after she was launched, for then we discovered that the scow was too narrow and the cabin too wide; the gearing too high and the stern too low. In short, everything about her was just the opposite of what it should have been.



Yet, in spite of all that we surely had greater sport with this unique creation than we would have had with a tailor-made craft, for when any feature did perform in a manner approaching its normal function we thumped our expansive chests and fairly beamed with pride. A greater content we could not have known.

Do not infer, I beg you, that Aunt Kate did not cruise, for she did cruise—on a few memorable occasions. In fact, no less than three times did she churn the uncharted waters at the extreme upper end of Lake Chapin, 15 miles from the home port, and what is more, she brought her entire crew back with her to tell the tale. A voyage of this length, however, is one we embarked upon with great trepidation, for there were many wild, uninhabited reaches along the course, much swift water and acre upon acre of stumps. If Aunt Kate didn't slough her rudder she was likely to squat for a protracted rest upon a submerged log, or else have gastric trouble in her power plant and leave us stranded a mile—maybe two miles—from the nearest habitation. And at such times mutiny was always imminent. Columbus never needed a stouter heart nor greater courage



than the skipper of Aunt Kate when cruising the fearful wastes of Lake Chapin.

Usually, however, we were content to make a 3-mile voyage to the fishing banks off Cedar Point. Here the waters were so black with bass, pickerel, croppies and turtles that it was with difficulty the unobtrusive Aunt Kate was persuaded to shoulder her way among them to our objective point. In the deep places our anchor would not reach bottom, but we were content to drift with the reassurance that sooner or later we would snag a harrow, or a barb-wire fence, or an ex-corncrib, for Lake Chapin lies over lowland farms that were submerged when the 22-foot dam was built at Berrien Springs.

Mighty good sport, I say, with a well-stocked larder and a congenial crew, to cast anchor at eventide and fish from one's own front porch. Then, without getting up from the comfortable camp-stool, to toss our catch to the cook and have them served on board a few minutes later, crisp and crackling and brown. Those were the happy days!

But no longer will Aunt Kate delight the hearts of her crew and guests, for she is now falling into decay on a lonely islet far from the haunts of men. Last Summer I came across her pitiful old hulk, battered by Winters' storms and dilapidated almost beyond recognition. The roof had all but fallen in, her blackened hull had cracked amidships, window frames had long since dropped away, and she lay there, a silent tomb for happy memories, while the gaunt pines soughed a dirge for her passing.



Rigging Plan for a Small Cruising Yawl

By R. M. Haddock

IN laying out the rigging plan for a cruising yawl of about 25 feet water-line, or for that matter of any size of boat, simplicity and consistent regard for strength of the different members, is always the keynote of a well-balanced design.

In shrouds and other standing rigging where turnbuckles are used, the weakest point usually develops in the threads of the buckle screws. It is useless to use a heavy shroud or stay if the turnbuckles, as is frequently the case, are too small and light, on the ground of neatness of appearance. This is especially true with racing craft where everything makes for lightness and reduction of windage aloft.

While this is an all-important item for these boats, it is not at all needful or even desirable in a cruiser. As a matter of fact, the use of slightly larger dimensions of standing rigging than are absolutely necessary to withstand the stresses, gives an air of solidity and strength, that is more pleasing to the eye and in keeping with dimensions of the spars themselves.

In threading the screws of the turnbuckles the diameter is reduced by double the depth of the thread, and this inside diameter is further weakened by the nicking of the threads, as it were, over what the strength would be if the diameter were that of a smooth rod. The loss is such that from 20 to 25% reduction in tensile strength results under these conditions. That is to say, with a tensile strength of 20 tons for the full size unthreaded rod, one would only be safe in using 15 to 16 tons tensile strength, in calculating the stress on the diameter inside threads.

Taking, for example, a 3/8-inch diameter shroud of mild steel, the breaking stress is about 2.25 tons. With a factor of safety of 6 the safe working load would be .37 ton. The safe working load for a 3/8-inch iron bolt —as given by "Mackrow"—is .15 ton, and a 9/16-inch —outside diameter—thread in a turnbuckle would be required to equal the strength of the 3/8-inch shroud. This calculation is for wrought iron of about 20 tons tensile strength, but with steel of about 26 tons tensile strength 1/2-inch diameter would be sufficient.

Manganese bronze is about the same tensile strength as the steel generally used in making turnbuckle threads, Tobin bronze about 30% stronger, and phosphor bronze about the same as iron.

A very frequent cause of breakage in the lower screw thread of turnbuckles is due to a lack of play in a thwartship direction. The chain-plate standing fore-and-aft, and the clevis of the buckle screw being a close fit and set up tight, a severe strain ensues when the mast head goes over under wind pressure—as witness the large amount of slack always found in the lee shrouds—even in moderate weather.

Eyes in chain-plates should stand athwartships—that is, so that the pins in the buckles stand fore-and-aft—to allow the buckle to readily adjust itself to the lead of the shroud under all conditions. Should the eyes stand fore-and-aft it is better to interpose a shackle between the buckle and plate.

All eyes in wire rigging should be spliced around thimbles, and the strands worked full of tallow or grease before parceling and serving. Dipping in melted tallow is a good plan to insure its penetrating to the core.

Eye splices for the mast head can be—and usually are in small work—sewed up in rawhide; but parceling, serving, and painting is better treatment for the deck ends of standing rigging, as water running down tends to keep the splice always damp. After serving the grease should all be carefully removed by washing in gasolene before painting, and the paint worked well in around strands where they go under the serving. A good grade of yacht marline or hard laid cotton cording is best for serving and should be put on under considerable tension.

Undoubtedly the splice would last longer uncovered, but besides a poor appearance it tears hands and clothing on contact, as the ends of strands are always very sharp and cannot be tucked under.

For the running rigging a good grade of manila rope such as "Plymouth" is preferable for yacht use, and either 3 or 4-strand can be used. The 3-strand rope is more flexible than the 4-strand, rendering more easily especially when wet—a desirable feature when endeavoring to shorten sail in stormy weather. While 4-strand is smoother and will wear slightly longer, having more surface, it is apt to get very hard and stiff when wet.

A good quality rope should be light in color, have long yarns of a silky, oily fibre and be smooth and free from short fibre ends so common in cheap grades. Rope should be coiled down right-handed or with the hands of the clock, and should always be well dried out before stowing below. All ends should be whipped with sail twine, or neatly pointed and sewed up with a hitch stitch.

Eye splices should be neatly made and tapered off, a whipping of twine being placed at the end of the last tucked strands, and close up to the eye of the thimble. It is better not to cover or serve the eyes in manila rope, as doing so tends to rot it.

All running gear should be reversed end for end at least once each season, as this adds greatly to the life of the rope.

In the matter of blocks the tendency is to select too small a size. As a rule when selecting blocks for a certain size manila rope, having found one that just fits snugly, take the next larger size.

Of late years, due to refinements and saving of weight and windage aloft, the old-fashioned lignumvitæ blocks with the patent or roller-bearing sheaves have almost disappeared from the rigs of yachts of under 60 feet over-all length; a bronze block of small size and cast with very thin cheek pieces having come into general use. Some of the more expensively made kinds of these blocks are very satisfactory, but the market is filled with a cheaply made product that gives poor service.

As a rule these metal blocks have plain pin sheaves with no bushings, and in many cases the pins themselves are cast one-half integral with each cheek and are seldom in alignment when put together. As the material itself is apt to vary in quality one pin wears faster than

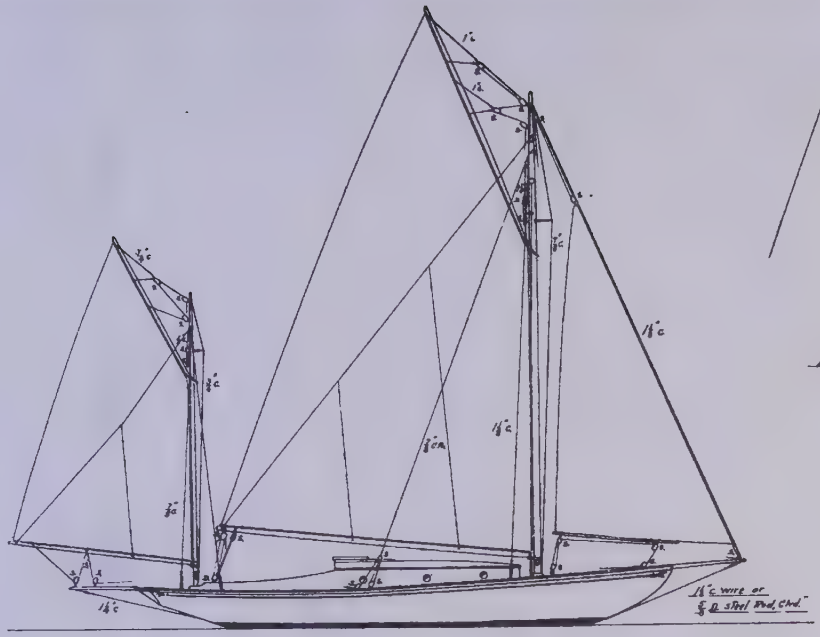


Fig. 1.
"Rigging Plan. 25ft W.L. Yawl."

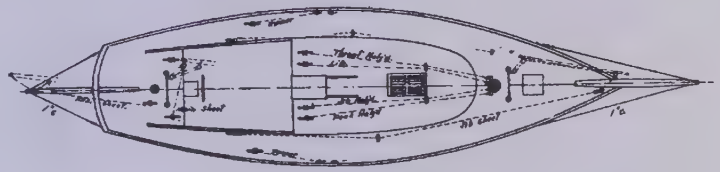


Fig. 2
"Deck Plan. with Sheet and Halyard Leads."

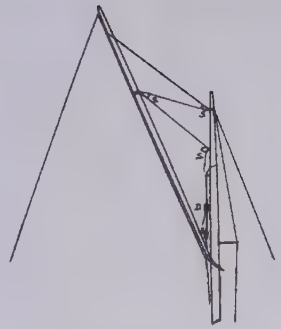


Fig. 3.
Simple Peak Halyard Lead.



Fig. 4.
Mast Head Plan.

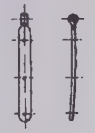


Fig. 5.
Correct form of Chain Plate.

"Standing Rigging"

Jib Stay	1⅛"	Gin. Steel Wire.	
Bob Stay	1½"	" "	or ⅝" Diam. Steel Rod.
Main Shrouds	1⅛"	" "	
Mizn. "	¾"	" "	
Boomkin Stay	1½"	" "	
Main Gaff Bridle	⅝"	" "	Flex.
Mizn. " "	½"	" "	
Main Throat Pennant	1½"	Cir. Steel Wire	
Mizn. "	¾"	" "	
Main Strut Stay	⅝"	" "	
Mizn. Strut Stay	½"	" "	
Runners.			

Details of Yawl Rigging

the other, thus throwing the sheave out of line after short use.

For the cruiser there is, happily, no need for such saving of weight, and the wooden block is much to be preferred, for with its roller-bearing sheaves it is practically frictionless, and by reversing the pins once in a while it will give as good service in the years to come as when new.

To the veteran sailor the sound of these patent sheaves clacking in their blocks—"Orators" we used to call them—as the racing fleet got ready to leave their moorings, was a joy forever. While today the same maneuver reminds one of a parrot's prayer-meeting.

The size of a wooden block is designated by the length of the shell or cheek in inches, and the unit is the circumference of the rope to be rove. Three and one-half times the circumference is the rule for hauling tackle such as halyards, sheets, etc. For example: For ⅜-inch diam. rope which is 1⅛-inch cir., multiply 1⅛ by 3½, which gives 3.93 inches, or a 4-inch block.

Proper sizes of standing rigging for the yawl under discussion in this article would be about as follows: Jibstay and main shrouds 1⅛-inch cir., bobstay 1½-inch cir., mizzen shrouds and main truss-stay ⅞ inch cir., boomkin-stay 1¼-inch cir., main gaff bridle 1-inch cir., mizzen gaff bridle ¾-inch cir., both flexible wire. Mizzen strut-stay ¾-inch cir., main throat pennant 1¼-inch cir., mizzen throat pennant ⅞-inch cir., and runners ⅞-inch cir., also flexible. Side stays to bowsprit and boomkin 1-inch cir. For the running rigging, all manila, main halyards, jib sheets, mizzen sheet and main lifts 1⅛-inch cir., mizzen halyards, jib halyards and mizzen lifts 1-inch cir., jib down-haul and jack stays ¾-inch cir., main-sheet 1½-inch cir.; 1¼-inch would be sufficiently strong for this latter, but the larger size gives a better hauling grip on this much used sheet.

The crew in boats of this size being frequently short handed, it is very desirable to have the jib sheet so arranged that it is self-tending when beating, and that all halyards and lifts lead so as that they can easily be reached by the man at the wheel. To accomplish this there should be a traveler or horse for the jib—which also should have a club on the foot—and the sheet should lead aft along the deck to within easy reach of the helmsman.

The main and jib halyards lead through cheek blocks on the foot of the mast or swivel blocks attached to a saddle to cleats each side of the companion slide on the after end of the cabinhouse. In placing these cleats do not have them directly in line with the lead of the halyards, but turn the forward end outboard about 15 or 20°, which will greatly facilitate belaying. This also is true of jib-sheet cleats on side of coaming.

The main-sheet can either have one standing and one hauling part or both ends hauling parts. This latter permits of always trimming this sheet from the weather side on either tack.

The main-boom of a yawl should be from 15 to 20% heavier than that of a sloop of the same size, and the fullness carried well into the ends, as the strain coming only at the extremities of the spar tends to bow it upwards badly when trimmed down hard, spoiling the set of the sail—in many cases permanently—for fine windward work, and the average yawl certainly needs all the advantage it can get on this point of sailing.

If the gaffs of the main and mizzen sails are long and rather light it is better to use the bridles as shown in the rigging plan, Fig. 1. If they are shorter and heavier the more simple lead, as shown in Fig. 3, will answer equally as well.

Likewise if the masts are sufficiently stout and well proportioned the truss-stays can be dispensed with.

The main and jib halyards and one lift are brought aft over the house roof as shown and the other lift belays on a cleat at the foot of the spar, or on a pin if a pinrail is fitted. The mizzen halyards belay on cleats or pins as the case may be at the foot of their spar, a goose-neck band in combination with belaying pins being a good fitting here.

Deck fairleaders are used to guide sheets and halyards clear of house sides, skylights, and other obstructions.

On the starboard side of deck plan, Fig. 2, is shown the lead for the self-tending jib sheet, and the lead for the conventional double head sheet is shown on the port side.

Hinged spreaders about 20 inches in length and a strut about 12 inches are shown on the main mast above the jaws of the gaff, and a strut only on the mizzen mast about 9 inches in length.

The main-sheet lead has one double and one single block on the boom and one double block on the traveler and belays cleats on each side of the same. If main-sheet with one standing and one hauling part is desired a double block on boom, with a becket, and a double block on the traveler is needed. The final part belaying on a cleat placed athwartships on the center line, just aft of the steering gear housing. Cleats for the halyards lifts and sheets should be about 7 inches long at least, and that for the main-sheet 9 inches where two are used and 10 inches where only one. The hollow type of metal cleats is by far the best for all uses, and in placing cleats see that there is plenty of room to belay quickly without danger of skinned knuckles and jammed fingers. In placing cleats and hauling parts always think of the poor user and "have a heart."



Putting the Punch in the Power Boat

By Charles A. Starr

THE power boat can get along without many things which are considered desirable to have, but there is one thing it must have, if the "motor is to mote," and that is electric juice. I know that many times another kind of juice is used to heat up things aboard; but though it may make a man spark—when there's a pretty girl at hand—it will not produce the kind of a spark which ignites the gas, that gives the power, that turns the crank, that moves the shaft, that carries the wheel, that makes the boat go.

Little drops of gasolene,
Little sparks of "juice,"
Set the pesky engine
Running like the deuce.

To make this spark vital to the internal-combustion engine there are all sorts of devices from a group of dry cells, coil and a few wires to plugs, timer and ground, to an elaborate self-starter, ignition and lighting system, which cranks the engine, generates current for the ignition and for cabin, running and other lights. Hundreds of boats, not alone of the putput class, but rather pretentious cruisers, cling to the primitive ignition outfit, and use oil lights, and I presume this is, to a large extent, due to a fear of trouble from the added wiring, or because there is no convenient storage battery recharging station; knowing little about electricity, the owners do not know that the battery may be recharged every time the boat is run and that a novice easily may learn to run an electric light plant once it is properly installed. But unless one does learn, there are trains of trouble due daily; though there are systems which are almost foolproof, and all of them require more letting alone than anything else.

For a small boat the simplest ignition outfit starts with a permanent magnet generator which supplies from three to six amperes at six volts. It will drive by friction from the flywheel, by belt or chain from the shaft, or by gear bolted to or shrunk upon the flywheel rim next to the engine. The size of the flywheel and r.p.m. are factors in determining what generator to use, since they vary in the required number of revolutions to produce a sufficient current. They usually are provided with a governor to insure a constant rate of speed.

If it is to be used for ignition only and the storage battery is not to be installed, the wiring is simple. If the generator is not marked to indicate positive pole, attach wires to the binding posts and put the other bare ends in a weak solution of sulphuric acid while the generator is running. Bubbles will come from both wires, but the greater number from the negative wire. Put a dab of red paint on the positive side so you will not need to test again.

The generator always should be in the plane of the engine base, that is, the base of the generator and engine base should be parallel or identical, to insure proper drive. Run a wire from the positive pole to ground on the engine. It is a good idea to drill a hole through the base and put in a telegraph binding post, or machine screw and nut, but the wire may be put under the head of a bolt on the engine base, or connected to a spring clip fastened under a bolt. The wire should have water and grease insulation. In fact, all wires used on a power boat should be water and oil or grease proof. They should not be of the house wiring type, with a single insulated wire, but be of the cable type, that is, a number of small wires twisted together. Run a wire from the negative pole of the generator to the coil binding post marked "M" or "Mag." (or "Bat."). If for a make-and-break engine the coil will be of the simple induction type. Its use is to step up the current to sufficient voltage to ignite the mixture when the igniter points open mechanically. Connect the other binding post of the coil to the binding post on the igniter; if there be more than one cylinder, connect the other igniter binding posts with a wire, called a bus bar.

If jump-spark ignition is used, a vibrating coil is needed for each cylinder; these are assembled in a box and a unit which does not work well may be replaced in a moment in most makes. The coils should be fastened in a dry place, as near the engine as possible and easily accessible. Connect the negative wire as before to the magneto or battery binding post. For each cylinder there is a timer and spark-plug connection to be made.

The timer binding posts are usually in line with the battery binding posts and should be marked "T." The timer wire may be single or multiple for any number of cylinders, but it is much simpler and neater if multiple wire is used, that is, one cable for each timer binding post enclosed in waterproof loom. The separate strands are colored differently, so that coil and timer connections may be made correctly without difficulty. Sometimes the timer connection on the coil is on top behind the vibrator and on one form of coil the battery wires are connected to the vibrator assembly by a binding post.

The spark-plug connection is under and usually protected by a hard rubber cylinder to prevent escape of the current. The wires heretofore have been primary wires. For the spark plugs a wire with heavier insulation must be used, since the current has been stepped up to high voltage. Naturally the connections to timer and plugs must be made in the firing order of the engine.

For starting, a set of dry cells is needed, to be wired from positive or carbon (center) pole to the ground on engine base; the other pole wired to one of the battery connections on the coil. A double throw switch or double plug switch enables change from battery to generator after the engine is well started. The dry cells are to be connected in series, that is, carbon of one cell to zinc of the next, and so on until one zinc and one carbon are left; these will be the negative and positive poles of the battery.

Many prefer to use a storage battery instead of dry cells, particularly when it is desired to have electric running and cabin lights. It is an element of safety as well as convenience to have these lights, unless one is candidate for harp and halo. In the first place it is unsafe to fill and light oil lamps in cabin or engine room of a

boat. Gasolene fumes most surely will be present, and, mixed with air, it only needs a spark to make things begin to happen. Never set lamps on the floor to light; the fumes are heavier than air and settle near the floor. Better be safe than sorry; hold the lamps high when lighting, if it be necessary on account of wind or storm to ignite them under cover; but do not do it unless absolutely required. The storage battery simply takes the place of the dry cells for starting and the ignition wiring is the same; separate wires are connected to the storage battery for the lights.

A very common form of ignition is from the magneto. This differs from the permanent magnet generator in that it produces an alternating current instead of a direct current, and cannot be used to charge a storage battery. A low-tension magneto produces a low voltage which is stepped up by an induction coil and instead of vibrators the current is mechanically broken by interrupter points and there is a distributor box for timing the spark to the cylinder. The magneto is driven by gear, belt, or chain; never by friction. The fact is that most boatmen call anything which has a part resembling a magnet a magneto and have little conception of its construction or principles, nor of the particular brand of juice it produces.

The high-tension magneto is wound so that it produces a current of high voltage without a separate induction coil, the current going direct to the plugs through the distributor box. With either high or low magnetos full wiring directions are given, simple enough for one with average gumption to follow.

When I acquired my third boat, which was the second —an open Palmer launch—with a cabin built upon it, and decided to sleep on the deep during the warm nights, I wanted lights. That meant a storage battery. Opportunely I acquired a "magneto" from a friend. It was of the permanent magnet generator type, a Hinricks J, requiring a speed of 2,500 r.p.m., sadly run down at the heels, but soon put in condition by a repair man. I talked soft to the repair man until he drew me a sketch of a double throw switch which would enable me to utilize excess juice in recharging the storage battery. I priced switchboards, and nothing under $50 would fit my requirements and then did not fit my purse. Ah! I would build one.

I bought for a dollar a marble slab, second hand and punctured by the holes of a former switch arrangement, and an assortment of single and double throw switches, some wire and a dozen telegraph binding posts. I had the nerve on hand. On second thought I invested in a voltmeter and a charge and discharge ammeter to go upon the board. As the latter was large enough, I mounted the coil upon the board, so that all circuits were centered there.

Having no wiring scheme to copy, it took me some time and many changes to get the lighting circuits so they would work when a trouble lamp was hooked up on each set of binding posts in turn, but at last the switches did what I wanted them to do; but what a sorry tangle of wires there was on the back of the board. Several evenings were spent in reducing the wilderness to order and when the board was set up in the cabin and everything was wired up, the only change necessary was to reverse one set of wires to a meter.

I had switches for cabin lights, running lights, searchlight, to cut in the voltmeter and cut out the ammeter and a double throw switch designed by my friend, the repair man, and built by myself, by which I could start on the battery and then throw over to the permanent magnet generator, and it all worked. There was everything but a cutout, and I knew that my rate of charge never would catch up with the discharge when I was using lights all the time; but I would occasionally forget to throw off the switch and once or twice the roll of the boat swung the engine over just enough to make contact in the timer, and then I had a battery which needed recharging when I came again. I had a fine time making the board in addition to acquiring a valuable adjunct for sailing comfort, and incidentally learned a few things about wiring.

Modern engines, except they be of low power, are equipped with self-starter, lighting and ignition systems. As the self-starter maker will not sell you his product except through the engine maker, you will not be troubled to install it. It may be of the single or double unit type; that is, the engine and generator may be separate, or may be combined in one casing. Many of the engines at the recent show were equipped with Leece-Neville starters, mostly single unit, and the Bosch exhibit had starters of both types.

I asked H. Clifford Brokaw, principal of the West Side Y. M. C. A. Motor Boat School, what he thought of the self-starter for the power boat, and he told me of a chauffeur who came to him for advice recently and prefaced it by saying:

"They can all have six, eight or twelve-cylinder engines with self-starters, if they want them, but give me the little old four-cylinder with a crank on the front end."

He referred to the auto, where self-starters have been developed, and where troubles have multiplied with their coming. Mr. Brokaw feels much like the chauffeur, that the added convenience is not worth the troubles which come in its train. He thinks the self-starter is not an advantage to all craft. Most boats do not run enough to keep the battery charged, the starter works indifferently and the manufacturer is blessed.

The starter takes a high discharge from the battery, which therefore must be kept at maximum capacity. If the boat is on the go every day and not much current is used for lights at night, the battery probably would be kept charged, but the man who takes only week-end trips would better stick to the crank handle.

Because of the high discharge noted, it is necessary to see that the engine is ready to run before trying the starter; if it does not start in fifteen to twenty seconds, find out why. It is the engine so long as the starter turns it over; if it does not turn it is the battery or the starter, or the wiring between; possibly it is dirty contacts or brushes. The battery needs more attention with the self-starter and water must be added to the cells more frequently.

Troubles which might be found in the starting engine are: broken brush spring, brushes worn too short, sticking brushes, switchblades making poor connection, switch-rod disconnected, drive pinion loose, or if Bendix drive sticking because of dirt in the threads; overrunning clutch slipping, wires short-circuited, broken, or loose or dirty at connections; field or armature windings short-circuited or grounded; resistance in switch disconnected. Systematic search will discover these, but it is a pretty good rule not to bother starting engine or generator unless there really is trouble.

Often trouble doubles
When 'tis brought to view;
So, never trouble troubles
Till troubles trouble you.

In the single-unit starting system the engine becomes a generator after it starts; in the double-unit system there is a separate generator. As full wiring instructions accompany either it is unnecessary to write of this. In general the systems are foolproof and all one need do is to keep the generator connected to the battery and see that the wires do not vibrate loose, or become broken or oil-soaked; then if the engine is run enough in the daytime it will keep the battery charged. Troubles are most likely to be in the brushes or connections. Do not try to run the generator with battery disconnected, or the shunt winding will be burned out.

The storage battery, as stated, is one of the most important elements of a boat electric system. Do not try to economize in this; it is likely to cost more in the long run if you buy a cheap battery. Also keep away from the fellows who advertise to charge the battery for nothing or almost nothing. One always pays double for something he gets for nothing. The best battery made is about 80 to 86% efficient; unless it is built to receive the charge generated it is worse than no battery; it should not be charged (or discharged) at a higher rate than about 10% of its capacity. The positive side of the generator must positively be connected to the positive pole of the battery; reversing the polarity will quickly weaken the battery so that it will not function.

When I first bought a storage battery I was told to avoid a certain make, because it sulphated badly, and a certain other make was recommended as non-sulphating. Frankly, "there ain't no sech animal." The storage battery always is sulphating during discharge and breaking up the lead sulphate in recharging. The chemical reaction is: $PbO_2 + Pb + 2H_2SO_4 = 2PbSO_4 + 2H_2O$. Some lead is lost in recharging and becomes a sediment in the bottom of the cell and must be cleaned out once in a while. I have been running a storage battery for three years and it is in fine condition, but I know many who get little more than a year of service.

The storage battery must not stand idle for long periods. It ought to be recharged every six to eight weeks, and if for a self-starter, every four weeks, unless your generator keeps it fully charged all the time. In laying it up for the Winter, it should have Winter charging once a month; or, wash it out after emptying out the electrolyte; then fill the cells with distilled water and place where it will not freeze. In service the electrolyte must be kept above the top of the plates. Water should be added a little at a time and often—once a week in Summer. Do not inspect the battery with a match or torch more than the gasolene tank; it exhales hydrogen gas, which is very inflammable. Use a trouble lamp.

A voltmeter and a hydrometer are needed to test the efficiency of the battery. The voltmeter will tell whether there is enough "kick" in the battery for ignition and the hydrometer the amount of the charge. They cost about $1 each. The Willard Storage Battery Company sells a good hydrometer at that price and will give you for the asking a book on the care of the storage battery which may save you the price of a new battery. In general, keep the top clean by washing with strong ammonia, which must not get inside the battery, and keep vaseline over the terminals, which much be free of dirt or corrosion. Have the battery fixed solidly in a dry place; do not drop it or leave it where it will topple over when the boat rolls. It is chiefly of lead and heavy; besides it should not slop over and lose electrolyte. Test its condition frequently with the hydrometer.

Between the generator and battery there is a cut-out and probably a current regulator. The cutout is an automatic switch which severs the battery connection when the speed of the generator drops so that voltage produced is lower than that of the battery, and reconnects it when the generator voltage increases. Do not change the adjustment. Let George, the repair man, do it. It is too much for a novice. The regulator is sealed so you cannot get at it.

Dry cells should be kept away from the heat of engine or galley; they are dry only in name and if they ever get dry the amperage will be gone quickly. If you find the amperage gone when on the way home, you may be able to revive cells by punching a hole through the sealing wax on top and adding a little water, or uric acid to each cell. I have known vinegar or a lemon from the galley to do the trick and enable one to get home. Then put in a new set of cells and put the old ones on the shelf of the locker and next Winter use them to light locker or cabin while you work.

In wiring boat for lights use double wire circuits and not a grounded circuit. I prefer the ordinary twisted wire used for house extensions, run in the open, for lights. If desired it may be run in wood conduit strips to be had of any electrician, but usually it can be run along the mouldings out of sight yet instantly inspectable. Run a wire to the farthest light and from this side, wires to accommodate other lights. Solder the connections, using one of the paste solders for the purpose. Support the wires by fibre or porcelain cleats. The lamp bulbs should be tungsten or mazda for economy's sake.

If it is desired to use electric running lights, wires may be run through the deck by means of waterproof connectors and oil lamps may be turned into electric lamps by adjusters, both to be had at any supply house. Lamps of 2 c.p. are large enough for the running lights and 4 c.p. for cabin lights. For searchlight from 10 to 15 c.p. is needed. If you want compass and bulkhead lights, 2 c.p. is sufficient. These should be of the same voltage as the battery. Do not put too many lights in the cabin. One or two lights properly placed will give all the illumination needed. Globes which diffuse the light are desirable. One 2-c.p. lamp in galley and toilet will be enough. A trouble light is best for the engine room on the small boat, as it can be moved to give light anywhere needed.

In looking for troubles in the lighting system, if all the lamps refuse to light, look to battery first, for run down battery or loose or broken connections; then at the switch connections. If only one circuit is affected, examine wires from switch to each socket for breaks or loose connections. When a single lamp is affected, socket connections are broken or short-circuited or the lamp is burned out.

Any type of switch may be used, but a good one with throws for each circuit and a fuse block will be more efficient and will save lamps.

Ignition wires should be kept apart from each other and from lighting wires and should not touch the engine or other metal parts except as provided for necessary connections. A fibre form or strut is best. Particularly is this true of secondary wires, for the high current will leak in spite of insulation and occasionally will affect

the firing of the engine. Heat and oil destroy the insulation and are to be avoided.

If the engine stops or will not start, first test to see if there is a spark at the plugs. Loosen wire from one of the plugs and hold it ⅛ inch from top of plug as engine is turned over. If there is a good spark ignition system probably is all right. See if there is gasolene in the carbureter. Do not adjust the carbureter if it has been running all right, for it is practically impossible for it to get out of adjustment unless it has help from someone's fingers.

If you are getting enough gas to the carbureter and the compression seems to be all right, look at the spark plugs, or try out one that you know to be all right and see if you get an explosion when turning over the engine with the switch on. If so, clean or replace the other plugs and see if engine runs.

If the engine is a two-cycle model, see if crank case is flooded and drain out gasolene. Do not stand and crank the engine expecting that in some way the engine will start up from sheer cranking. Use more gray matter and less muscle to solve the trouble. Systematic elimination of causes of trouble will locate the difficulty in a few minutes. Don't guess what it is; find out. I know no better system than the trouble rule in use at the Y. M. C. A. Motor Boat School, given herewith. The novice should have no trouble in finding what is wrong by its use, though I prefer to start the test by finding out if there is a spark at the plug. That accounts for failure to turn on the switch, loose battery wires and a lot of things right off.

Y. M. C. A. General Trouble Rule

Above all *remove nothing from the engine* except as directed to test rules.

Needed to Make an Engine Run.

1. Gasolene	Is tank full? Are pipes clean? Is carbureter clean? If carbureter needs adjusting, do it, otherwise leave it alone. Does manifold leak?
2. Compression	To test—Open all pet-cocks except the one on cylinder to be tested; crank engine, noticing how strong the compression is in each cylinder, in turn.
3. Ignition —at the right time.	A. Test for a spark by taking the wire off any plug; hold wire about ⅛ inch from plug; crank engine with switch on. Spark should jump to plug. B. *Are the batteries run down?* Does the vibrator (if any) buzz? Is timer clean? Does timer rotor make *good* contact? C. Are any wires loose, burnt, wet, broken, or short-circuited? Are spark plugs clean and are points 1/50 inch apart? D. Does magneto armature revolve? Is safety spark gap clean? Are interrupter points clean and adjusted right? Do all brushes make good contact? Is distributor clean? Is distributor rotor loose, broken, or making poor contact? E. Check magneto wires as per "C."

Note—Loose wires and terminals and neglected batteries, also dirty gasolene cause much trouble.
To keep a gas engine running cooling and lubrication are necessary.

Redivivus

White wings, they sometimes get weary,
When carrying me cheerily over the sea;
Night comes, I long for my dearie,
I turn on the gasolene, speed home to thee.



Police Harbor Patrol Boat Bluecoat, Built by the Gas Engine and Power Company, 55 Ft. Long, 9 Ft. Breadth. Power 125-H.P. Speedway, Speed 19 Miles

Designs

Express Cruiser Elf

THE express cruiser Elf was built by Stanley Vansant, of Atlantic City, N. J., from designs by Bowes & Mower, for Louis H. Eisenlohr, of the Philadelphia Y. C. She is equipped with two six-cylinder Van Blerck engines, which give her a speed of 22 miles per hour.

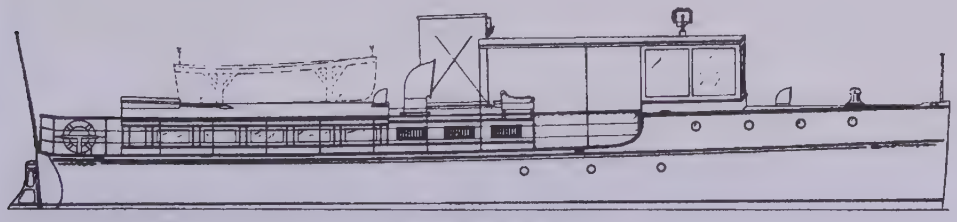
She is of the latest type of express cruiser and is suitable for Government use as a scout patrol boat in case of need. She would come in the class that is known as "B Fast" and would mount a one-pounder forward and a rapid fire gun on her after deck. Mr. Eisenlohr has already offered the boat to the Government in case of need.

Her accommodations consist of a very roomy after cabin with a permanent berth at the after end and extension transoms on each side, so that three persons can be accommodated for sleeping. The galley is forward of the main cabin on the port side and contains a large ice-chest, the latest type of alcohol cooking range and the usual galley fixtures. On the opposite side is a toilet room, which has a shower bath. The engine room is amidships and contains the crew's quarters, with accommodations for three men. The gasolene tanks are located in the engine room and have a total capacity of 450 gallons, which gives the boat a very large cruising radius. The owner's stateroom is forward under the raised deck and contains two comfortable berths and an extension transom, so that three people can sleep here if necessary. There is also an owner's toilet room forward of the stateroom.

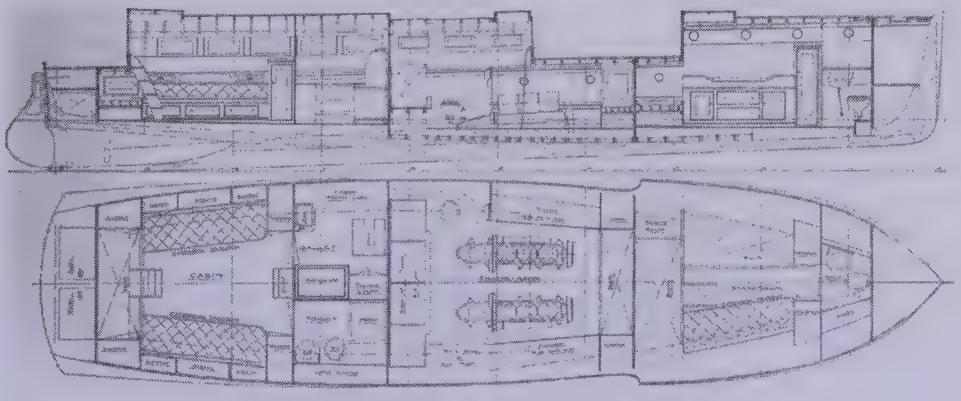
One of the attractive features of the boat is the large bridge deck over the engine room, which is fitted with a glass enclosure at the forward end and storm curtains at the after part, so that it can be made entirely open in fine weather and closed in bad weather. The boat is of very handsome appearance and has been much admired by all who have seen her in Florida, where she has been in constant use.

The general dimensions are:

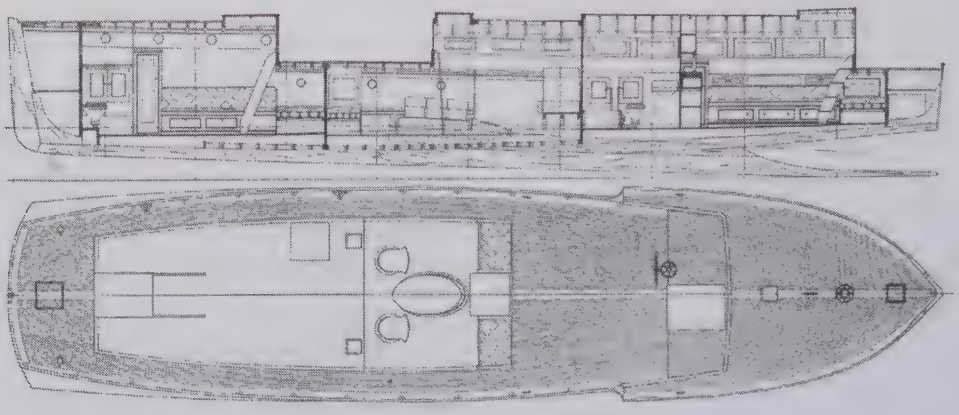
Length o. a.	51 feet
Breadth	11 "
Draught	3 "



Outboard Profile of Elf



Arrangement Plan of 51-Footer, Elf. Designed by Bowes & Mower



Deck and Interior Elevation—Starboard Side—of Express Cruiser Elf

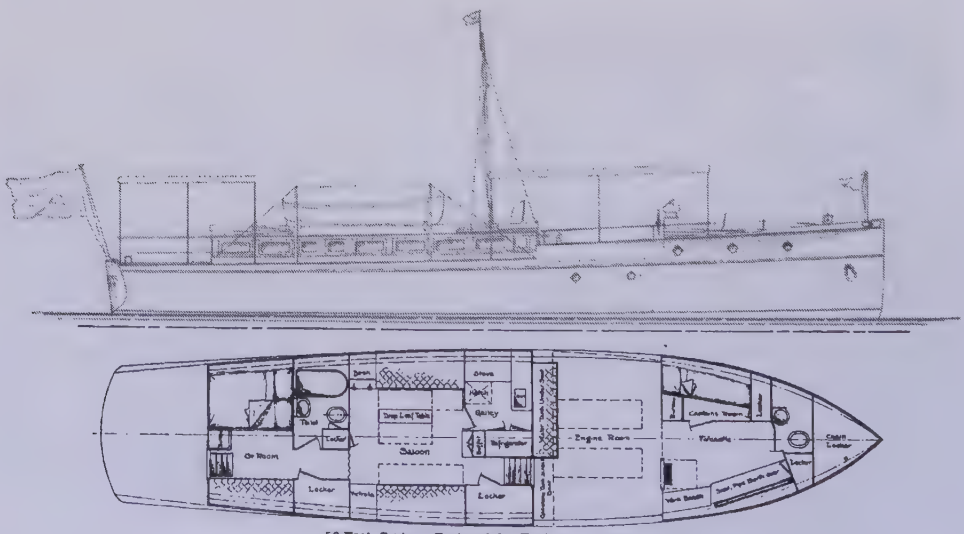
56-Foot Power Cruiser

A most attractive 56-foot power cruiser has been designed by Frederic S. Nock, which is being built at his yard at East Greenwich, R. I.

The forward part of the boat for a distance of 25 feet is given up to the forecastle and engine room, the engine being situated under the bridge deck. The power plant is to be controlled entirely from the bridge, with electric starters, etc.

As shown on the plans, there is very little room around the outside of the boat. There is a companionway with entrance from the bridge, a large locker on the starboard side, and a galley of ample proportions on port side.

The saloon is arranged with two extension berths and will afford sleeping accommodations for two persons on each berth. There is a drop-leaf table, desk, buffet, Victrola stand, etc. Aft of the saloon on the starboard side is a large wardrobe. Directly opposite is a bathroom, with the owner's stateroom at after end of the boat, filled with a double berth, divan, bureau, etc. The gen-



56-Foot Cruiser, Designed by Frederic S. Nock

eral finish of interior is plain, with mahogany trim; the crew's quarters and engine room, cypress finish; exterior bright work, mahogany.

The power plant consists of two 50-h.p. engines.

The general dimensions are:

Length	56 feet
Breadth	13 "
Draught	3 "

98-Foot Cruiser

A staunchly constructed boat of seaworthy type, intended for service on Lakes Michigan and Superior, has been designed by the Matthews Boat Company, the plans of which are printed herewith. This yacht has the double deckhouse arrangement with the dining saloon and galley in the forward house and a ladies' cabin aft. There is a separate lounging shelter aft of the ladies' cabin. The owner's quarters are below deck and consist of two large double staterooms each fitted with two double berths; three single staterooms, two bathrooms and separate locker accommodation for each room.

The engine room is amidships and is to be equipped with two 200-h.p. heavy-duty engines, which will drive the yacht 15 miles an hour. The gasolene tanks are at the after end of the engine room and have a total capacity of 1,200 gallons. Ventilation in the engine room is provided by means of a stack directly over the room.

The captain's bridge is aft of the galley and raised so that the helmsman has a clear view in all directions. The crew's quarters occupy the space forward of the engines and consist of a messroom, three single staterooms, and a forecastle having two transoms and two pipe berths.

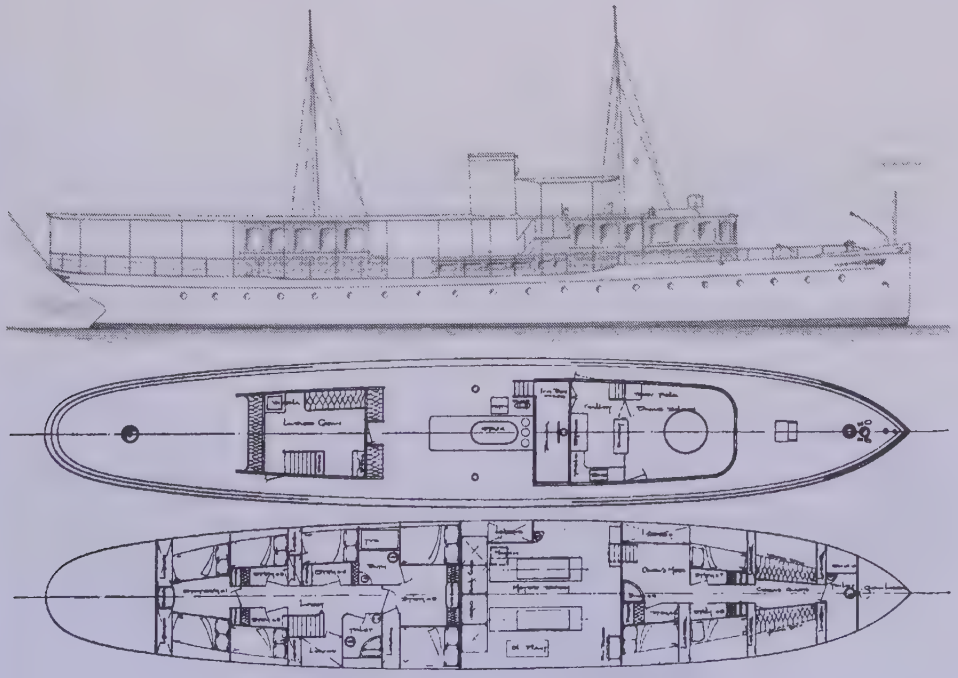
The deckhouses are of mahogany, the decks of white pine. The finish below decks is in mahogany and cream enamel.

The general dimensions are:

Length	98 feet 0 inches
Breadth	17 " 6 "
Draught	5 " 6 "

Hydro-Aeroplane Tender for Signal Corps

A 52-foot tender for use in cooperation with the war hydro-aeroplanes at the Norfolk station is being built by the Chance Marine Construction Company from designs by J. Murray Watts, the plans of which are printed herewith. This boat is to be driven by a 150-h.p. Model F-M Sterling engine, which will give a fair rate of speed in spite of the generous breadth and heavy construction



98-Foot Lake Cruiser, Designed by the Matthews Boat Company

necessary to a boat of this type. A powerful derrick and winch is carried so that a damaged 'plane can be lifted on to the deck. The boat is also equipped with the necessary work-bench and tools so that repairs can be made at once.

This tender will act as a mother ship to the air fleet, and can carry a large number of spare parts, fuel, lubricating oil, etc., as well as having liberal accommodations below for four men. The deck beams have ample strength to support the recoil of anti-aircraft guns. The whole construction is rugged and the outboard appearance of the boat gives a hint of her workmanshiplike qualities.

An important part of the equipment is the 20-inch Navy type of searchlight, current for which is supplied by a 4-k.w. Universal electric light plant.

The general dimensions are:

Length	52 feet
Breadth	14 "

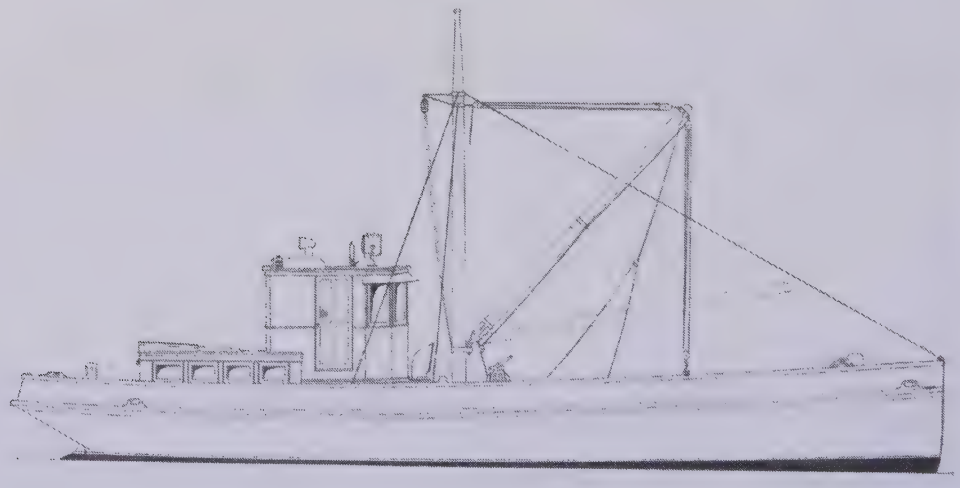
72-Foot Power Cruiser

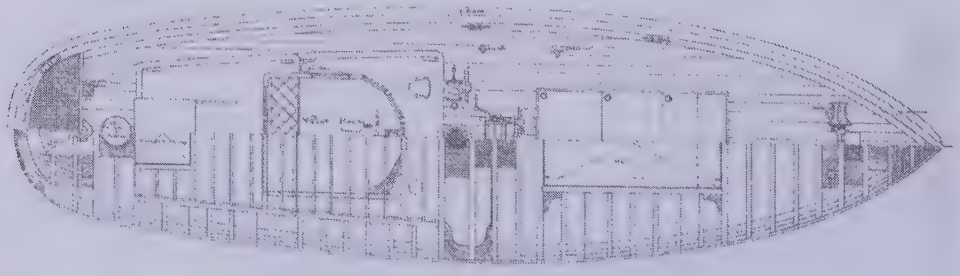
William Laidlaw has had a 72-foot water-line cruiser designed by Swasey, Raymond & Page, plans of which are published herewith. The vessel will have a raised deck forward, aft of which there is a trunk at the after end of which is the bridge. This trunk is a continuation of the forward raised deck. Another trunk extends over the engine room giving light and ventilation and over the owner's quarters aft.

This vessel is fitted with a military mast for signaling and one stack. The accommodations below are very commodious.

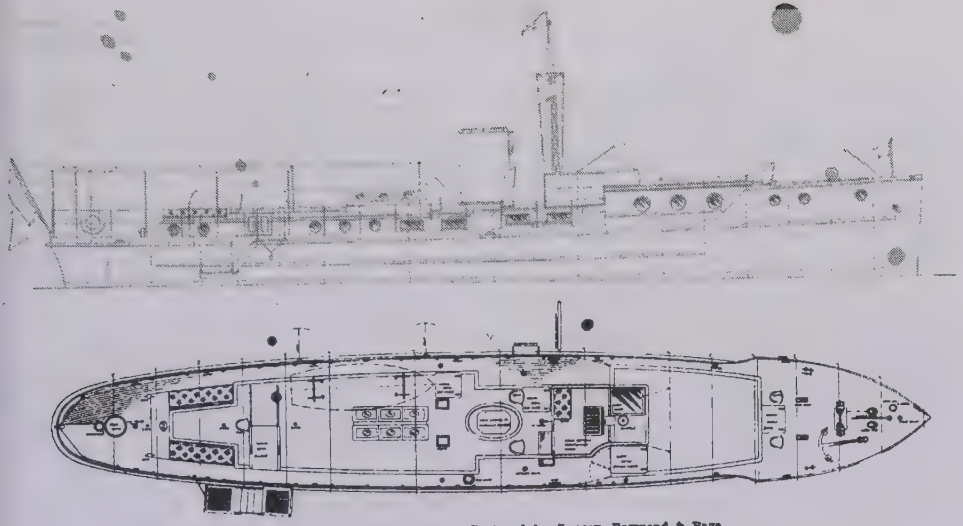
The general dimensions are:

Length o. a.	73 feet 9 inches
Length l. w. l.	72 " 0 "
Breadth	12 " 1 "
Draught	4 " 4½ "

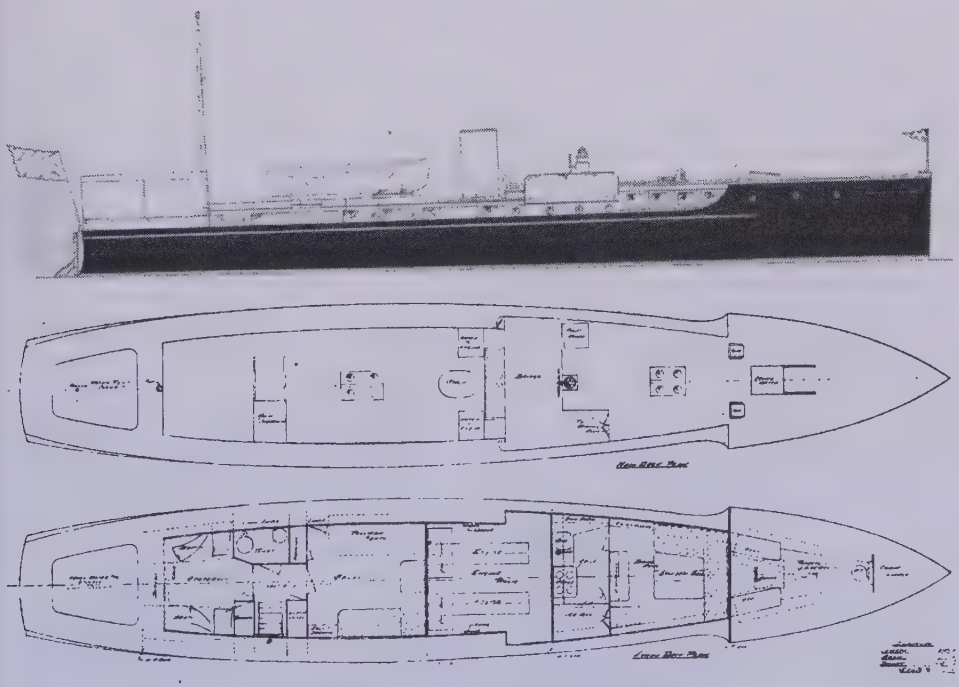




52-Foot Hydro-Aeroplane Tender, Designed by J. Murray Watts



Wm. Laidlaw's 72-Foot Cruiser, Designed by Swasey, Raymond & Page



65-Foot Cruiser, Designed by Luders Construction Company

66-Foot Cruiser

A 66-foot cruiser, designed by the Matthews Boat Company, is very similar in model to the Leonore type which has been so popular in the past few years. The change consists in elevating the dining saloon forward to a height where persons seated inside can have a clear view in all directions. The arrangement aft, consisting of two double staterooms, side entrance, bathroom, and double stateroom forward, gives as much room as is possible in a boat of this length and still provide for the engine to be placed amidships.

The galley is immediately aft of the dining saloon and on a lower level, permitting great height and good ventilation to be given in this quarter where it is so much needed. A separate berth for the captain has been provided partly underneath the seat at the forward end of the dining saloon and partly under the forward deck. Additional berths for crew are in the forecastle forward. In construction, this boat is heavy and is given plenty of breadth and draught to produce a seaworthy type.

The finish of the dining saloon is of mahogany throughout. The owner's quarters aft are in mahogany and cream enamel and all exterior joinerwork in mahogany, with white pine decks.

The general dimensions are:

Length	66 feet 0 inches
Breadth	13 " 6 "
Draught	4 " 3 "

65-Foot Cruiser

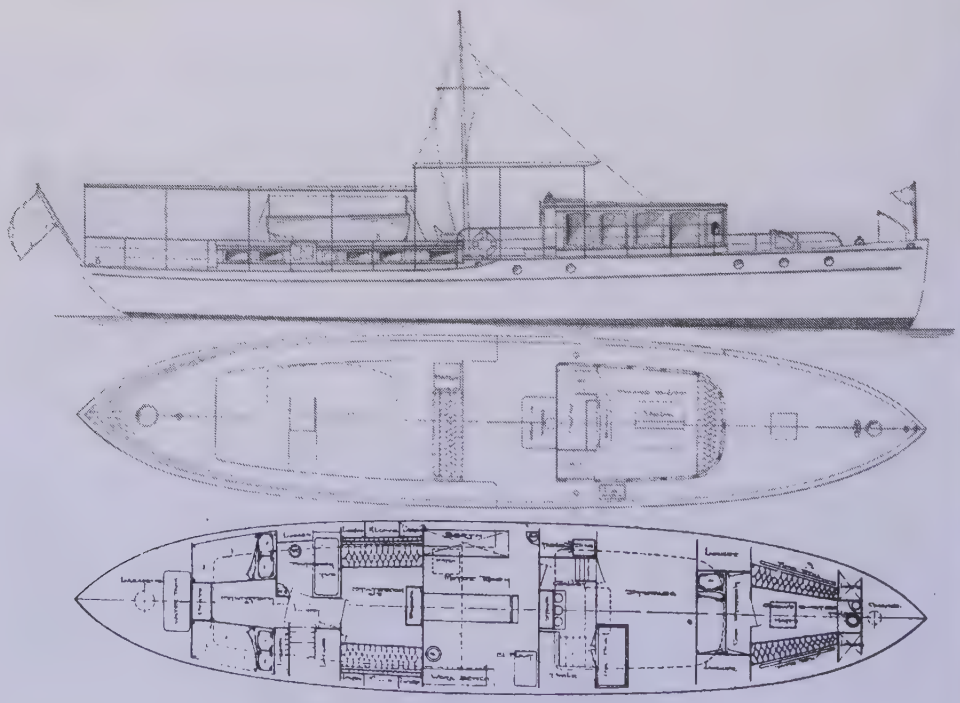
A 65-foot power cruiser has been designed by the Luders Construction Company, which is most attractive in appearance and looks every inch a patrol boat. This craft has a straight sheer, raised deck forward, and in model is similar to the Pattina built by this company for Sir Charles Ross, of Quebec, Canada. In designing this yacht it was kept in mind that it could be used as a fast and efficient scout boat or submarine chaser.

Pattina was built for high speed and with Duesenberg engines she made some wonderfully fast and consistent trials, one of which was 25 miles an hour for more than 11 hours. She was to have run for 18 hours but the inclement weather made this impossible.

The raised deck forward gives ample headroom in the forecastle and dining room. The bridge deck is aft of the dining room, aft of which is the stack. The galley is under the bridge and aft of this is the space for the engines—a compartment divided from the rest of the yacht by bulkheads. Aft again there is a saloon the full width of the yacht and still farther aft a large double stateroom. With two six-cylinder engines this yacht can be driven 20 miles an hour.

The general dimensions are:

Length o. a.	65 feet 0 inches
Breadth	11 " 6 "
Draught	3 " 6 "



66-Foot Cruiser of Leonore Type, Designed by Matthews Boat Company

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

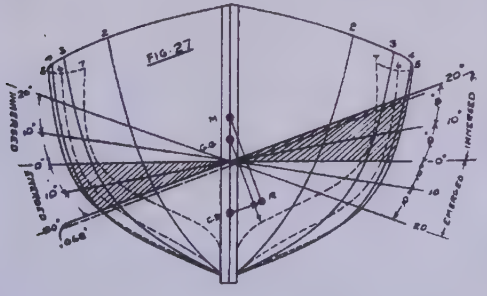
PART V

I WILL now explain the combination method* of calculating a boat's stability and I will illustrate my explanation by making a complete set of calculations for one transverse inclination of Fig. 14 boat. Before the transverse stability of a boat can be calculated, displacement volume to upright L.W.L., and vertical locations of both C.G. and C.B. points must be known.

In Part II the volume of Fig. 14 to upright L.W.L. (plane A) was calculated and found to be 120.678 cubic feet†, and in Part III the vertical C.G. and C.B. point calculations were made and it was ascertained that C.G. point is located 0.42 foot above the L.W.L. plane A, and that C.B. point is 0.85 foot below plane A. I can, therefore, begin the actual stability calculations.

First, it is necessary to draw across the scale drawing of cross-section outlines of boat an *assumed inclined* L.W.L. This assumed L.W.L. is drawn at required inclination (inclination for which transverse stability calculation is being made) and *must* intersect with upright L.W.L. at the *exact* center line of boat. It does not matter whether one wedge is apparently larger than the other, because later the *exact* inclined L.W.L. will be determined and marked.

Fig. 27 shows Fig. 14 boat's cross-sections with the assumed 20° inclined and upright L.W.L. marked.



Note this.—For the purpose of making illustration and my explanations as clear as possible I have shown whole cross-sections, the forebody ones being in full and the after in dash lines.

*Known as Barnes's method of calculating statical stability.
†The half-volume ascertained by making calculations referred to is 60.339 cubic feet, therefore the whole is twice that volume.

Having marked the assumed inclined L.W.L., the next thing to do is to divide immersed and emerged wedges into a proper number of planes for a Simpson rule calculation. This must be done because, instead of remeasuring the whole of inclined underwater body, I am going to measure wedge volumes and then by calculating their moment of transference, or the value of

Vol. of wedge × distance C.G. point of wedge moved,

I will determine the distance that C.B. point moves out from center line of boat.

As the volume of wedge-shaped portions that are immersed and emerge from water when a boat is inclined transversely is ascertained by making a Simpson rule calculation, the wedges must be divided into a proper number of equally spaced sections and radial planes for the calculation. The sections are correct in number for a Simpson's first rule calculation, so all that is necessary is to divide the wedges into a correct number of radial planes. I have divided them into two parts, thus there are three radial plane ordinates.

I have already explained that to calculate the volume of any figure by Simpson's rules it is necessary to first determine the area of either planes, or sections, and then by using these area figures as ordinate lengths for a second calculation the volume is ascertained. This procedure is followed when calculating wedge volumes, but in place of using actual ordinate length measures for the area part of calculation, the figures used are *one-half the square of the ordinate length measures;* and of course the interval measure between radial planes is the *angular* interval in degrees. In the illustration it is 10°. The volume of wedges can be determined by using either plane or section areas for second part of calculation, but as transverse stability calculations require that transverse movement of C.B. point be determined it is necessary to calculate volume by using radial plane areas.

This is an excellent point at which to make a short preliminary explanation of the calculations I am about to make.

The calculations are made by using Simpson's rules and are divided into two parts, called preliminary, and combination calculations; the preliminary ones being for the purpose of ascertaining the area and transverse C.G. position of assumed inclined L.W.L. plane, area and moment figures for use in the combination calculations; and the combination ones being for the purpose of determining volume of wedges, the moment of transference of wedge volume, the correct inclined L.W.L., the transverse movement of C.B. point, the righting lever length, and the righting moment. To

make and complete each calculation separately would require a repetition of many figures and duplication of work, so instead of making separate complete calculations to determine area, volume and moments, the three calculations are combined and all needless figures are eliminated entirely.

The complete calculations follow and immediately above each tabulation I have explained the headings, tabulation and calculation figures.

Explanation of Tabulation No. 1

This is a preliminary calculation to determine area of assumed inclined 20° L.W.L. plane, and to obtain figures to use for volume and moment of transference of wedge calculations.

You will note that immersed and emerged portions of plane are calculated separately and afterwards the area and moment of *entire* plane, and distance its C.G. point is one side of center line is determined.

In first column is entered ordinate numbers for radial plane calculation.

In second column is entered measured lengths of ordinates. These measurements are taken along the 20° radial plane from center line of boat out to where plane cuts each cross-section outline.

In third column is entered the proper Simpson's rule multipliers.

In fourth column is entered the product of second and third column figures. These figures are only used for area of L.W.L. plane and its C.G. point calculations.

In fifth column is entered the half-square of ordinate lengths used for wedge volume and correction of inclined W.L. parts of calculation.

In sixth column is entered Simpson's multipliers for column 5.

In seventh column is entered product of columns 5 and 6.

In eighth column is entered cubes of ordinate lengths used for moment of wedge part of calculation.

In ninth column is entered the Simpson multipliers for column 8.

In tenth column is entered product of columns 8 and 9.

You will note that the one-third Simpson multipliers are omitted. This is done because work is simplified and shortened by using totals of columns for the combined portion of calculation, and multiplying final figures of calculation by both the longitudinal and angular intervals.

On the lower part of Tabulation No. 1 the area and moment of *entire* assumed inclined L.W.L. and distance the C.G. of whole plane is one side of center line is ascertained. This distance must be known before the correct L.W.L. can be calculated.

This part of calculation tells us that:

Area of the *whole* 20° inclined plane is 107.32 square feet.

The C.G. of the whole plane is 0.416 foot from center line, towards immersed side. (Immersed side is largest.)

Tabulation No. 1

Preliminary—20° Water Plane Emerged Wedge

Ord. No.	Length of Ord.	S M	Function of Ord.	Half Square of Ord.	S M	Function of Square	Cube of Ord.	S M	Function of Cube
1	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00
2	1.33	4	5.32	0.88	4	3.52	2.35	4	9.40
3	2.00	2	4.00	2.00	2	4.00	8.00	2	16.00
4	2.31	4	9.24	2.67	4	10.68	12.32	4	49.28
5	2.33	2	4.66	2.71	2	5.42	12.64	2	25.28
6	2.12	4	8.48	2.25	4	9.00	9.52	4	38.08
7	1.68	1	1.68	1.41	1	1.41	4.74	1	4.74
			33.38			34.03			142.78

Preliminary—20° Water Plane Immersed Wedge

1	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00
2	1.87	4	7.48	1.75	4	7.00	6.53	4	26.12
3	2.79	2	5.58	3.89	2	7.78	21.71	2	43.42
4	3.17	4	12.68	5.02	4	20.08	31.85	4	127.40
5	3.25	2	6.50	5.28	2	10.56	34.32	2	68.64
6	3.04	4	12.16	4.62	4	18.48	28.09	4	112.36
7	2.71	1	2.71	3.67	1	3.67	19.90	1	19.90
			47.11			67.57			397.84
									142.78
								Both wedges,	540.62

Preliminary—20° Radial Plane Area and C.G. Calculation

	Function of Ord.			
Immersed wedge .	47.11	Immersed wedge .	67.57	
Emerged wedge ..	33.38	Emerged wedge ..	34.03	
	80.49		33.54	Excess
⅓ interval =	1.333	⅓ interval =	1.333	
Area =	107.32	Square Feet	44.72	Moment
				Excess on immersed side

Excess moment .. 44.72 / Area = 107.32 = 0.416 foot C.G. is on immersed side

Explanation of Tabulation No. 2

Tabulation No. 2 shows 0° and 10° radial plane calculations. These calculations are made in same manner that the 20° calculation was made, except that function of ordinate figures is omitted because it is not necessary to determine area and C.G. of these radial planes.

You will note that there is only one tabulation for the 0° radial plane which, being the upright water plane has both sides alike, therefore one-half of plane is measured and by doubling final total the function of cubes for both sides is ascertained.

Tabulation No. 2

Preliminary—10° Water Plane Emerged Wedge

Ord. No.	Length of Ord.	Half Square of Length	S M	Function of Square	Cube of Ord.	S M	Function of Cube
1	0.00	0.00	1	0.00	0.00	1	0.00
2	1.40	0.98	4	3.92	2.74	4	10.96
3	2.15	2.31	2	4.62	9.93	2	19.86
4	2.48	3.07	4	12.28	15.25	4	61.00
5	2.56	3.27	2	6.54	16.77	2	33.54
6	2.33	2.71	4	10.84	12.64	4	50.56
7	1.95	1.90	1	1.90	7.41	1	7.41
				40.10			183.33

Preliminary—10° Water Plane Immersed Wedge

Ord. No.	Length of Ord.	Half Square of Length	S M	Function of Square	Cube of Ord.	S M	Function of Cube
1	0.00	0.00	1	0.00	0.00	1	0.00
2	1.66	1.37	4	5.48	4.57	4	18.28
3	2.54	3.22	2	6.44	16.38	2	32.76
4	2.85	4.06	4	16.24	23.15	4	92.60
5	2.95	4.35	2	8.70	25.67	2	51.34
6	2.79	3.89	4	15.56	21.71	4	86.84
7	2.44	2.97	1	2.97	14.52	1	14.52
				55.39			296.34

Both sides = 296.34 + 183.33 = 479.67

Preliminary—0° Water Plane Both Wedges

Ord. No.	Length of Ord.	Half Square of Ord.	S M	Function of Squares	Cubes of Ord.	S M	Function of Cube
1	0.00	0.00	1	0.00	0.00	1	0.00
2	1.45	1.05	4	4.20	3.04	4	12.16
3	2.25	2.53	2	5.06	11.39	2	22.78
4	2.60	3.38	4	13.52	17.57	4	70.28
5	2.70	3.64	2	7.28	19.68	2	39.36
6	2.50	3.12	4	12.48	15.62	4	62.48
7	2.25	2.53	1	2.53	11.39	1	11.39
				45.07			218.45

Both sides = 218.45 × 2 = 436.90

Explanation of Tabulation No. 3

The Combination Calculations

The first combination calculation is for the purpose of ascertaining thickness of layer that must be deducted in order to correct and equalize wedge volumes. The volume of immersed and emerged wedges is determined, then the lesser volume is deducted from the greater and only the *difference* is put through final part of calculation. This shortens work very greatly.

In first column is entered the angle of inclination of radial plane.

In second column is entered the function of half-square totals obtained by making preliminary calculations.

In third column is entered the Simpson's multipliers for volume.

In fourth column is entered the product of column 2 and 3 figures.

If the *excess* is multiplied by one-third the longitudinal interval (this was not done when making the preliminary calculation), and also by one-third angular interval, the excess volume on largest side will be ascertained.

To find thickness of layer to take off, the excess volume is divided by area of *assumed inclined* L.W.L. plane, and then by multiplying the excess volume by distance C.G. of assumed inclined L.W.L. plane is out from center line of boat (ascertained when making preliminary calculation) the moment of layer is determined. This moment has to be deducted from moment of wedges before calculating righting lever length.

The second part of tabulation is for the purpose of ascertaining righting lever length and righting moment.

In first column is entered the angle of inclination of radial planes.

In second column is entered the function of cubes of *both* wedges.

In third column is entered the Simpson rule multipliers.

In fourth column is entered product of column 2 and 3 figures.

In fifth column is entered cosine multipliers for column 4 figures.

In sixth column is entered product of column 4 and 5 figures.

The cosine multipliers can be obtained from any table of cosines. They are cosines of the angle that each plane makes with the *level* of the *water*. This being the case the assumed inclined L.W.L. plane is level with the water and therefore, as it has no inclination (it is the 0° plane for righting lever) it must be multiplied by the cosine of 0°. The 10° plane, is multiplied by the cosine of 10°, and the 0° plane, as it is 20° from level of water, must be multiplied by the cosine of 20°. It is important to remember the above, because this part of calculation is for the purpose of determining the power the boat possesses to *return* to upright when the inclining pressure is lessened.

One-third of the function of cube for moment of wedge total is used for the final part of calculation.

If these figures are multiplied by the Simpson rule one-third longitudinal interval (this was not done when making preliminary calculations) and also by the one-third angular interval volume multiplier, the moment of wedges to *assumed* inclined L.W.L. will be ascertained; and if from this is deducted the moment of layer the corrected moment of wedges to *actual* inclined L.W.L. will be ascertained.

The corrected moment figures divided by displacement in cubic feet gives distance that C.B. point moves out from center line. This distance is *measured along a line drawn parallel* to inclined L.W.L. (The point R marked on Fig. 28.)

On Figs. 27 and 28 I have marked the corrected inclined L.W.L.' (See dash line drawn parallel with assumed inclined L.W.L.)

Point R indicates the *transverse* movement of C.B., but the point may not always be located at its exact vertical position because the vertical location of C.G. points of the two wedges has not been determined.

As R is *always* located *on* vertical line along which the C.B. inclined up pressure will act it is not necessary to calculate vertical position of C.B. inclined.

The length of righting lever can always be accurately determined without knowing the vertical position of C.B. inclined point, because the line C.B. to R is drawn parallel with the inclined L.W.L. and the vertical through R is always at right angles to the inclined L.W.L. The angle that up vertical through R makes with line from C.B. to R. is always 90°.

On Fig. 28 I show the lines and immediately below illustration I give a detailed explanation of each line.

Tabulation No. 3

Combination Calculation for Transverse Stability at 20°.

Calculation to Correct Inclined L.W.L. at 20° Inclination

Immersed Wedge				Emerged Wedge			
Angle of Inc.	Function Half Sq. Ord.	S M	Function Half Sq. for Vol.	Angle of Inc.	Function Half Sq. Ord.	S M	Function Half Sq. for Vol.
0	45.07	1	45.07	0	45.07	1	45.07
10	55.39	4	221.56	10	40.10	4	160.40
20	67.57	1	67.57	20	34.03	1	34.03
	Immersed =		334.20				239.50
	Emerged =		239.50 Deduct				
Excess on Imm. side =			94.70				
½ Ang. interval			.0581				
			5.502				
½ Longitudinal in. =			1.333				
			7.336 Excess volume on Immersed side.				

Excess vol. = 7.336 / Area 20° plane 107.32 = 0.068 foot. Layer to take off.

Excess vol. = 7.336 × 0.416 Dist. C.G. of plane is out from center line

3.051 Moment of layer to deduct from moment of wedges

Calculation to Determine Length of Righting Lever and Righting Moment at 20°

Angle Inc.	Sum Function Cubes Both Wdgs.	S M	Product of Function Cubes	Cosine Angle Inc.	Function Cubes for Moment of Wedges
0	436.90	1	436.90	.9397	410.55
10	479.67	4	1918.68	.9848	1889.51
20	540.62	1	540.62	1.0000	540.62
					2840.68
One-third of cubes =					913.56
One-third angular interval =					.0581
					53.077
One-third longitudinal interval =					1.333
					70.769 Uncorrected moment
Moment to deduct =					3.051
					67.718 Corrected moment

Corrected moment 67.718
120.678 = 0.56 foot B.R. measure

From the measure B.R. there must be deducted the distance from center line of boat out to perpendicular drawn down from C.G. point. This measure will always equal distance between C.G. and C.B. points, measured along center line of boat, multiplied by the sine of angle of inclination.

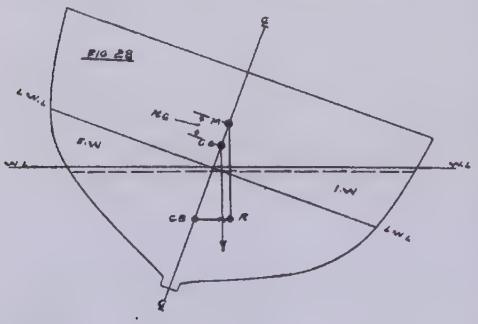
The sine of 20° is .342 and the distance between C.G. and C.B. points is 1.27 feet.*

1.27 × .342 = .434 to deduct

.560 — .434 = .126 foot righting lever length.

And as the righting moment is Displacement × Righting Lever, the righting moment is

7723 × .126 = 973 foot-pounds righting moment at 20°.



Explanation of Fig. 28

The illustration Fig. 28 shows view of the largest cross-section of Fig. 14 boat inclined to 20°, and on it I have marked lines and points mentioned in my stability calculation explanation.

C.L. is the center line of boat.

W.L. is the assumed water-line when boat is inclined to 20°.

Dash line immediately below W.L. is the correct inclined water-line.

L.W.L. is water-line when boat is upright.

E.W. is the emerged wedge.

I.W. is the immersed wedge.

C.G. is the C.G. point ascertained by making proper weight calculation.

C.B. is the C.B. point location when boat is upright.

R is the point found by making the moment of transference of wedge volume calculation and indicates the transverse movement of C.B. point when boat is inclined to indicated angle.

Line R.M. is line along which the up buoyancy pressure acts. It is always drawn at right angles to line W.L.

Line from C.G. down is line of action of down weight pressure. It is always drawn parallel with up buoyancy line.

Line C.B.X.R. is line along which lever length is measured.

X.R. is lever length.

C.B.X. is measure that must be deducted from C.B. X.R. before lever length is determined. This distance is always equal to measure from C.G. to C.B. points, along center line of boat, multiplied by sine of angle of inclination.

M.C. is metacentric height.

The calculations and illustrations indicate that while the Fig. 14 boat is stable at 20° transverse inclination the righting moment, when C.G. point is located at height indicated, is not sufficient to insure a steady boat. In fact, a righting moment of only 973 foot-pounds can be neutralized by the movement of three persons to one side of boat, or, what is the same thing, the boat will incline transversely to 20° if three persons sit on one side of boat. From this it is evident that the transverse stability at 20° is not sufficient.

I selected the Fig. 14 boat sections and located the C.G. point at the named height for the purpose of having an opportunity to demonstrate the great influence that *form* and location of C.G. has on a boat's stability. The facts, while frequently stated, are seldom driven right home by making an actual set of stability calculations for a boat having a form that must have the aid of a low location of C.G. to insure ample righting lever length at normal inclinations. The explanation of the actual value of 973 foot-pounds righting moment is clearly understandable to any layman when the statement is made that three persons sitting on one side of boat will incline boat to 20° transversely.

If it is desired to make Fig. 14 boat amply stable the C.G. point must be lowered at least 8 inches, and this can be done by lowering engine weight and using a small amount of ballast placed as low as possible.

So it is evident that a boat having cross-sections shaped like the Fig. 14 boat does not have sufficient stability of form at low inclinations.

On the other hand a boat having its principal cross-section shaped like Fig. 21 will have ample stability of form, and when C.G. point is located well above the L.W.L. righting moment will be ample. This can be seen by examining the illustration.

And it can also be said that a boat having cross-sections like Fig. 25 will have ample stability of form without ballast.

The Fig. 25 boat has a righting moment at 20° transverse inclination equal to about half the displacement, and this is about the minimum that a small power boat, like the one I am referring to, should have at 20° inclination. A study of table of transverse M.C. heights given in Part IV will help you to understand the trans-

*The C.G. calculation in Part III gave .42 foot as distance C.G. point of boat Fig. 14, 17 is above plane A, and C.B. calculation in same part gave .85 foot as distance C.B. point is below plane A, therefore

.42 + .85 = 1.27 feet distance between the two points.

verse stability requirements of small power craft. Note the transverse M.C. height of the Fig. 14 boat at 20° inclination, and also note that even with C.G. point lowered 8 inches the Fig. 14 boat will not have more than 15⅛ inches M.C. height.

Final Remarks About Stability

A designer must know the amount of transverse stability a boat has at all angles it is likely to be inclined to, so he calculates righting lever lengths for a few inclinations and by using the ascertained lever lengths as ordinate measures he lays out a curve of stability from which he can quickly ascertain not only the righting lever length for any named inclination within the range of curve, but also righting moments, maximum righting moment and range of stability, and inclinations between which boat is safely stable.

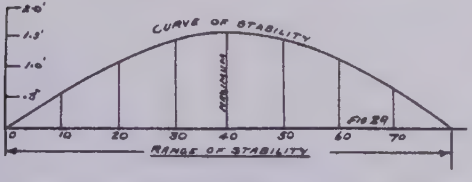


Fig. 29 shows a curve of stability for small power craft. To lay out such a curve for any boat a base line is drawn and divided off into evenly spaced intervals, and at each dividing mark an ordinate is erected at right angles to base. These ordinates are marked to indicate degrees of inclination, the first one being marked 0 and the others in succession advancing by 5 or 10°.

The 0 ordinate line is then divided into evenly spaced intervals to represent parts of a foot, base being called 0.

Next the stability lever length is calculated for a few inclinations taken about 10° apart, and lever lengths are measured along the proper inclination ordinates with same scale that 0 ordinate was divided. A curved line drawn to cut these points will be a curve of statical stability, the point where curve rises to its greatest distance from base is called the angle of maximum stability, and the number of degrees the curve includes is called range of stability.

Thus, by making a few calculations and plotting a curve it is possible to quickly ascertain righting lever length at any inclination, and if it is desired to ascertain righting moment for any inclination all that is necessary is to measure lever length for that angle and multiply measure by displacement of boat.

The righting lever at 20° of boat to which the illustration curve belongs is 1 foot.

Power and Resistance

On pages 37, 38 and 39 of January, 1917, issue of The Rudder, I explained power and resistance in a very detailed manner, so I will ask you to turn to that issue and carefully read the pages named.

In the next issue I will begin the work of designing a power boat of moderate size, and any reader of The Rudder who desires to design a boat of similar type but having dimensions of his own selection, can do so by reading my explanations. I will begin with the idea—"I will design a boat." Next I will prepare the preliminary drawing, make all preliminary calculations, and from then on I will take up each detail of shaping the lines, preparing the design, and making the calculations; and I will fully illustrate every detail of the work by reproducing the actual drawings and calculations.

Correction Fig. 25—In April issue, on page 317, eleventh line, the words "of the Fig. 14, 17 boat" should read "of a boat having same displacement that Fig. 14, 17 boat has."

(To be Continued)

Winners of the Fishing Boat Competition

THE winners of the 25-foot fishing boat competition are as follows: First prize ($50), John R. Andrews; second prize ($25), J. L. McKenzie, and the third ($10), Sydney M. Higgins.

Five sets of plans were sent in for the prizes offered by Baron Baretto and The Rudder. Baron Baretto wanted a set of plans for a 25-foot fishing boat for use in Florida waters which could be carried on the davits of a steam yacht. He also stipulated that provision should be made for a single-cylinder engine weighing 3,472 lb. The full conditions were published in the January issue of The Rudder. The first prize was $50, and The Rudder added the second and third prizes. Henry J. Gielow, the well-known designer, Clifford D. Mallory, a yachtsman of experience, and the editor of The Rudder acted as the judges.

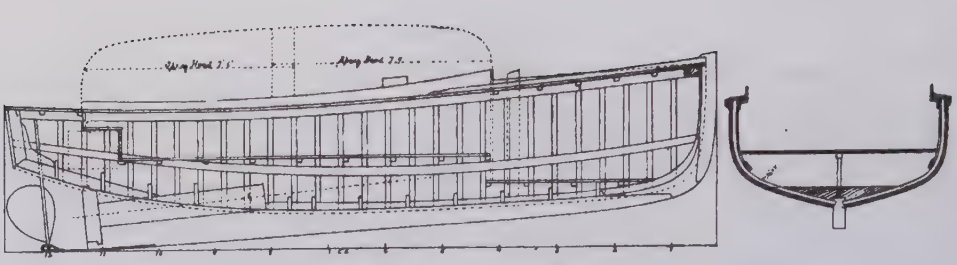
The plans were very carefully studied and each one submitted showed many good points, but those sent in by John R. Andrews, of Saco, Me., proved to be the best.

The conditions were rather severe for a boat for use in Florida waters on account of the great weight of the engine specified, which necessitated more draught than the average fishing boat would ordinarily have for these waters.

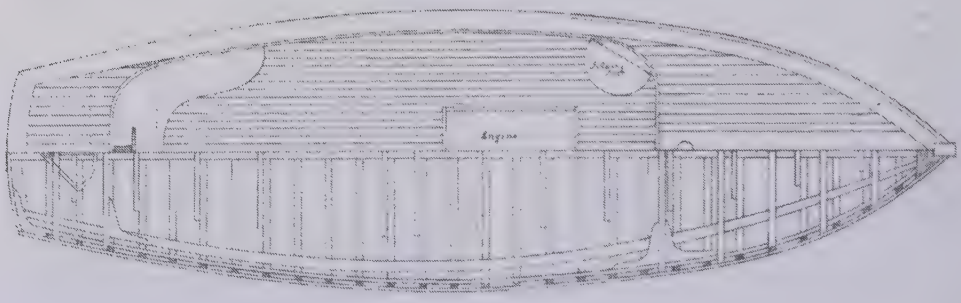
All of the designs miss the feature of a rocker keel, which is quite essential in Southern waters where a boat goes aground frequently, and with the greatest depth amidships a boat can easily be swung around and gotten into deep water. One other feature that no one incorporated is a fish well. This is quite necessary for the keeping of live bait, which is used to a great extent.

However, all the drawings are well executed and show considerable thought and we wish to thank the contributors for making the competition a success on such short notice.

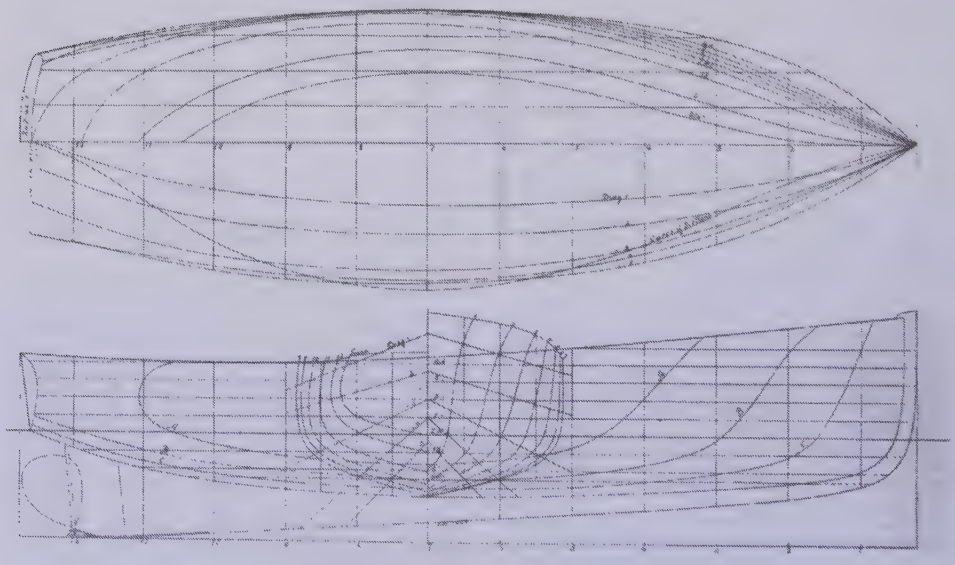
While Mr. Andrews missed the housing called for over the engine, this is a simple matter to add, and the judges selected his design because it was the widest and would therefore be steadiest; it shows a good clear cockpit for handling fish; and there are no obstructions aft for fishing over the stern; it could easily be handled on davits; has a well-balanced rig and is a good all-around boat for Southern fishing.



Construction Plan of Prize Fishing Boat



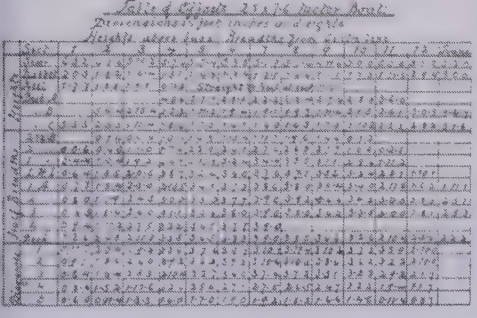
Deck Plan Showing Roomy Cockpit

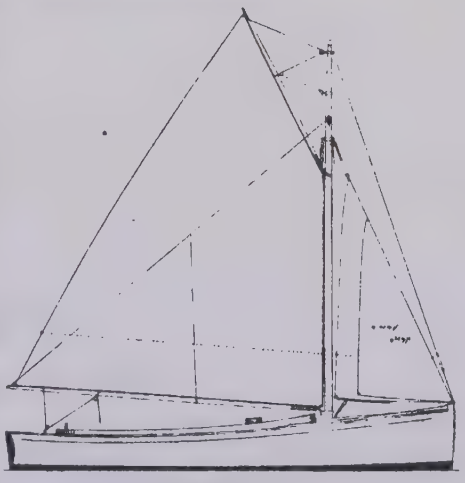


Lines and Sections of 25-Footer, Designed by J. R. Andrews

In the description of his boat Mr. Andrews says: "A very heavy frame has been provided for to carry the engine and this combined with the weight of the engine leaves about 500 lb available for ballast, which should be stowed well aft. The size of the engine makes it necessary to place it well forward of the center of buoyancy, and not knowing its center of gravity could not locate the exact position of the ballast. The sail plan is about two-thirds of what would be carried in an out-and-out sailboat. The mast is stepped through a heavy deck plate and is strong enough to be used without shrouds."

For the other competitions a great many plans have been received and it has been impossible so far to determine which are the winners. Each competition will be considered in turn and the decisions of the judges announced and the winning plans will be published. Lack of space in this month's issue prevents the publication of all the designs submitted in the first competition, but the others will be published in turn. This month the winning plans are given.





Sail Plan of Winner

Long Island Sound Y. R. A.

AT the annual meeting of the Yacht Racing Association of Long Island Sound, held at the Hotel Astor, New York, on March 21st, the officers for the coming year were selected and racing dates allotted to the various clubs.

James W. Alker, of the Manhasset Bay Y. C., was again chosen for president; Frank Bowne Jones, Indian Harbor Y. C., vice-president; Harry A. Jackson, Jr., N. Y. Athletic Club, treasurer, and Edwin H. Tucker, New Rochelle Y. C., secretary. The members of the Executive Committee are Stuyvesant Wainwright, American Y. C.; Clinton MacKenzie, Seawanhaka-Corinthian Y. C.; Geo. P. Granbery, New Rochelle Y. C., and Howell C. Perrin, Larchmont Y. C.

Although war had not been declared at the time of the meeting, the crisis was very grave and while it was thought best to arrange for the coming races it was mutually agreed by the officers and delegates present that in the event of war and its effect on this country being serious, each club would quietly call off their race as its date came along.

The advisability of calling off all sporting events is questionable and as it now looks our main duty will be more or less in the nature of patrol work. The strain of always being on the alert will necessitate frequent relief and relaxation. There is no finer, cleaner sport in the world than yachting to keep a man in good condition and take his mind, for a short period, off of other worldly cares.

The present indications are that there will be at least two yachts on the Sound this Summer, with Marconi rigs. The question of measuring them came up and the following rule was adopted:

MEASUREMENT OF MARCONI RIGS

P'—Distance measured in a straight line from the upper side of the boom at the mast, when touching the upper part of the gooseneck to the highest point of intersection of the mainsail halyards with the after side of the mast, (the top of the halyard sheave in the mast; the juncture with the mast of eyebolts or pennants of halyard blocks or of standing parts of halyards); unless the intersection of the projected lines of the leech and the mast comes above the shoulder, in which case the intersection shall be taken as the highest point of measurement.

S—The perpendicular from the mast to the line of P' taken where it is greatest.

R—The horizontal distance from the mast to a plumb line suspended from the upper point of measurement of P' taken on a line with the top of the boom at the mast when the yacht is on even keel.

The area of the mainsail shall be

$$\sqrt{P'^2 - R^2 \frac{B}{2} + \frac{2}{3} S} \times P'$$

Following are the dates and the clubs holding them. The Championship Races being indicated by asterisks (*).

*Wednesday,	May	30,	Harlem Y. C., Annual
*Saturday,	June	2,	Knickerbocker Y. C., Annual
* "	"	9,	Manhasset Bay Y. C., Annual
* "	"	16,	Larchmont Y. C., Spring
Friday,	"	22,	Seawanhaka-Corinthian Y. C., Special
*Saturday,	"	23,	Seawanhaka-Corinthian Y. C., Annual
"	"	23,	New York A. C., Block Island
* "	"	30,	New Rochelle Y. C., Annual
*Tuesday,	July	3,	American Y. C., Annual
*Wednesday,	"	4,	Larchmont Y. C., Annual
Saturday,	"	7,	New Rochelle Y. C., Stratford Shoal
* "	"	7,	Orienta Y. C., Annual
* "	"	14,	Indian Harbor Y. C.
* "	"	21,	Larchmont Y. C., Race Week
Monday,	"	23,	" " "
Wednesday,	July	25,	Larchmont Y. C., Race Week
Thursday,	"	26,	" " " "
Friday,	"	27,	" " " "
*Saturday,	"	28,	
* "	Aug.	4,	Horseshoe Harbor, Annual
* "	"	11,	Huguenot Y. C., Annual
"	"	11,	Harlem Y. C., Stratford Shoal
"	"	18,	Hempstead Harbor, Special
"	"	18,	Stamford Y. C., Annual
* "	"	25,	New Rochelle Y. C., Summer
* "	"	25,	Northport Y. C., Annual
Friday,	"	31,	Seawanhaka-Corinthian Y. C., Special
*Saturday,	Sept.	1,	Seawanhaka-Corinthian Y. C., Fall
*Monday,	"	3,	Larchmont Y. C., Fall
* "	"	3,	Norwalk Y. C., Annual
* "	"	3,	Sachem's Head Y. C., Annual
*Saturday,	"	8,	Indian Harbor Y. C., Fall
* "	"	15,	Manhasset Bay Y. C., Fall

Central Park Model Y. C.

THE Central Park Model Y. C. was organized on March 1st, in the office of Mr. Joseph C. Schauffler, and the following officers and trustees were elected: Commodore, John O. Berg; vice-commodore, Parker H. Kemble; treasurer, George W. Magalhaes; secretary, Howard Griffiths; treasurer, Joseph C. Schauffler; trustees, Fred A. Branig, Joseph McKenna and Michael C. Heider.

The object of the club is: To encourage the designing and building of models from which larger or full size yachts may be constructed and to demonstrate by actual test of the models, as far as practicable, the speed, stability and seaworthiness of the various types; also to develop the constructive ability of its members and to provide a healthy outdoor recreation.

The membership consists of three classes: Honorary, Active and Associate. Honorary members can only be elected by a unanimous vote and shall have all the privileges of active members except voting or being eligible for office, or having a voice in any business of the club.

The initiation fee for active members is $3 and the dues 25 cents per month, paid in advance. The initiation fee for associate membership is $1 and the dues 10 cents per month, paid in advance, or $1 per year if paid in advance.

The general management and control of the affairs, funds and property of the club is vested in a board of governors, consisting of the commodore, vice-commodore and the three trustees.

The commodore and vice-commodore must be owners of yachts enrolled in the club.

Classification and restrictions were adopted for three classes: The first will be known as the Alpha Class, the limits being 36 inches over all (no restrictions or limits on water-line length); a minimum weight of 6 lb and 700 square inches sail area. There are no restrictions or limits on breadth or draught.

A boat may be over the 6-lb weight but will not receive any premium for it, and any boat under will have to be ballasted to this minimum.

The sail area is B + A, divided by two. A being the height from the top of the deck to the highest point of the sail and B the distance from the tack of the jib to the clew of the mainsail.

The second is the 36-inch class under the following rule:

Maximum length on load water-line, 36 inches, with no limit as to length on deck. Maximum breadth to be one-third the L. W. L. length, extreme draught not to exceed 14 inches. Maximum sail area, 1,950 square inches (actual).

The 42-inch class has a maximum length on the load water-line of 42 inches, with no limit as to length on deck; maximum breadth one-third the L. W. L. length; extreme draught not to exceed 16 inches, and maximum sail area 2,500 square inches (actual).

One of the special features of the Alpha Class is that several of the model manufacturers have taken it up and to promote the class have arranged with the department stores to issue an associate membership card (good for one year) with each boat sold without extra charge to the buyer.



Views of C. A. Morse & Son's Yard at Thomaston, Me., Showing a Launching in Winter, Steam Yacht Fitting in the Spring, and Sail Yacht Ready for Commission

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Captain Newt of Block Island

Editor of THE RUDDER:

I recently read in THE RUDDER of the death of Leo Spitzer, the "King of the Thimble Islands." I have met Leo and he was quite a character and I was very glad to learn something of his history. From his conversation, actions and appearance, I imagined he was a "breed" of some kind but from a few transactions with him, I would have sworn he had Captain Kidd "lashed to the mast," and when we finally set sail with the yawl complete, I figured we were doing very well indeed.

If any yachtsman ever drops anchor in the Great Pond, Block Island, and does not pay a visit to "Captain Newt," his cruise will not be complete. We were cruising in the Sound and decided to run over to Block Island, none of us having been there. We arrived about sunset and anchored in the inner harbor and after a late supper took to our bunks. In the morning we were awakened by a "down East" hail of, "Ain't anybody alive aboard that ki-fi?" Upon answering the hail, he responded with "Tho't you was agoin' to sleep your heads off. Come ashore, got two quarts milk some feller left at my shack fer you boys. Where ye hail from? Perth Amboy—eh! Where's 'at? Do ye know 'Doc' Hanson, the old pirate? Well, he just left here four days ago. Come ashore when ye kin."



Capt. Newt

We were all quite surprised at such a greeting and I was anxious to see who the old salt was. I looked through the porthole and there he stood, breeches above his knees and ripped along the seam from stem to stern. He had a regulation naval blue blouse and an old black fedora hat. This was my first sight of "the Captain and crew of Cock Robin Inn."

"Cock Robin Inn" is Newt's "shore cruiser" and sits at the water's edge. The name has been boldly printed by some swordfisherman with the aid of a piece of manila rope and some green paint and the artist at the same time set forth the wonderful dishes which Newt could prepare, such as "pickled eels feet," "swordfish soup," etc.

Upon going ashore, he informed us that he was "Captain Newton Ball, Block Island, and a devil with the ladies. They come from New London, Boston and even as far as York to see Captain Newt and I allus treat 'em fine. Right this minute I got two dozen lobsters in the pot in case some of 'em might come over today, but if ye boys wants any, there they be."

In the evening we crowded into his shack and smoked as he chewed and spun yarns, all the while expectorating into a shoe which was more convenient than the doorway.

We spent two days in Block Island in company with "Capt. Newt" and we all voted they certainly were well put in. Upon leaving, Capt. Newt insisted that we take a bushel of oysters with us, as they were Block Island oysters and would not be on the market, and "anyhow I want you folks to advertise this brand for me down your way."

Capt. Newt was born on Block Island and has spent his entire life on or about the water. He is a descendant of the Ball family who have been on Block Island for many generations.

I am enclosing a film of Capt. Newt ("dressed up for ladies"), which you may care to print, and I want to say once more that any yachtsman visiting in or about Block Island should sail off his course to call on Capt. Newt as he is always glad to meet a "blowed in the glass sailor."

CHARLES J. STUMPF.



Commodore J. L. Stewart, of Chatham, N. B., and an Apt Pupil

The Chart Table

Editor of THE RUDDER:

I am interested in the question "How to determine the amount of leeway to allow for the strong breeze on the bow," because the same question has puzzled me on several occasions, but the answer in your January issue, on page 59, does not tell me any method for determining what allowance to make. I am sure there are many readers who would be interested in learning more on this subject.

New York. CHARLES SCHREIBER.

Leeway is a correction which has to be determined for each particular vessel. In large steamers this is done by observing how much leeway she makes at different speeds and different angles and force of wind. A rough table is made out from the data obtained. In small, slow-speed vessels a useful method is to observe the angle between the course and the wake of the vessel and allow that for leeway. If you are towing a log-line you can measure this angle on the lead of the line over the taffrail. The best method is to determine in clear weather what leeway you make under varying conditions and make a table for your particular boat. Suppose you ran between two lights and you make the light a point on the bow (tide correction allowed for, of course), you can then use this to allow for leeway under similar conditions.

* * *

Editor of THE RUDDER:

What is meant by the term landfall?

Long Island. T. L. JOHNSON.

Landfall, defined in landsmen's terms, is sighting land after a deep-sea voyage. Sailors, however, use the term very broadly and when, after a deep-water voyage, they sight anything that has a permanent position on the surface of the earth, such as a lighthouse, lightship, island, mountain or land of any kind, they call it making a landfall. In the North Atlantic trade Westbound steamers from Liverpool to New York make landfall if possible at Nantucket Light Vessel, but occasionally on some voyages the vessels have missed this light vessel and have stood on until Fire Island Light Vessel is sighted.

* * *

Editor of THE RUDDER:

Is it better to keep going on or to anchor in a fog?

New York. A. K. BROWN.

This is a pretty hard question and the circumstances alter the cases. If you are fairly sure of your position and are in open water keep going until you are in sheltered water and out of the way of possible traffic.

If you lose your position and are in shoal water or even worse, in rocks, work out of it slowly, or if you can anchor in good holding ground, drop the hook and wait for it to clear. In any case don't lose your head or try to run too fast. Work slowly and carefully. Even the best of pilots make mistakes and the real test is getting out of an unavoidable difficulty.

* * *

Editor of THE RUDDER:

Is it possible to have a rainbow in the moonlight?

New York. T. L. CRANE.

Why not? Ocean travelers often see them in the wake of a squall, particularly in high latitudes in Winter.

Editor of THE RUDDER:

How many flags are there in a hoist in the International Code?

Florida. T. L. JOHNSON.

One Flag—Yes and No and some special signals.

Two Flags—Attention, compass and urgent or danger signals.

Three Flags—General vocabulary.

Four Flags—Ship's numbers and geographical signals.

* * *

Editor of THE RUDDER:

Where can one find the time of sunrise and sunset?

Rhode Island. YANKEE.

In an Azimuth Table. Look up the latitude of the place where you are to the nearest degree. Turn to that latitude in the Azimuth book, pick out the declination column, noting when the latitude and declination are the same name or of opposite names, and you will find at the beginning and end of the columns the times of sunrise and sunset. Some Nautical Almanacs give it for principal ports of the world while in Bowditch's Epitome is a table for determining the same.

* * *

Editor of THE RUDDER:

I notice in all references to observation of the sun's altitude there are corrections added.

What is the reason for this?

New Jersey. M. G. H.

All observations of celestial bodies must be reduced to the relative position of the center of that body to the center of the earth, instruments are not always true, etc. The corrections to an observed altitude of the sun are the following:

Index correction. + or — according as the sextant used is out of true. This correction is found by a test of the instrument.

Semi-diameter. The navigator usually observes the lower limb of the sun, therefore, this correction is + to get the altitude of the sun's center. It is obtained from the Nautical Almanac and varies with the sun's distance from the earth.

Dip. The line of the horizon is not level with the observer's eye. The correction varies with the height of the eye above the surface of the sea and is always —. It is found in the navigation tables.

Parallax. This is a correction necessary on account of the observation being taken from the surface of the earth instead of the center, is always + and is found in the navigation tables.

Refraction is a correction necessary on account of the change of direction of the sun's rays passing through the atmosphere. It is always — and is found in the navigation tables.

The Engine Room

Editor of THE RUDDER:

I have a double-cylinder four-cycle Palmer engine, rated 10-12 h.p. at 400-500 r.p.m. It is located in the cockpit of my hunting cabin launch beneath a hatch which also covers the part of the engine which is above the floor. When I slow the engine to reverse, and then stop it, gasolene seems to condense in the intake mani-

fold, and flowing back through the carbureter drips through a small opening between the air inlet structure and the carbureter body, into the bilge. The carbureter is so located as to be hard to get at in case of fire. I desire to know under what conditions a four-cycle engine will "back-fire," and how such back-firing could ignite the carbureter. I should also much like to know what is considered the best way to care for this drip of gasolene from the carbureter, which by the way is a Schebler, with the air inlet set horizontally about 12 inches above the planking. Some advise ventilation while others claim that a drip pan would make for greatest safety. If I use a drip pan would a back-fire ignite this accumulated gasolene? In running this boat I control the engine from the steering wheel. I am told that should the needle valve become partly clogged the mixture would become too "lean" and back-firing would result. The valves are set in accordance with the Palmer hand book, the intake opening and closing on dead center, the exhaust opening at nine-tenths of power stroke and closing on center. I am planning to put in a new and stronger engine bed, and desire the very safest installation possible, as my guests are frequently women and children.

Can you help me?

New York. W. J. T.

We are more than pleased to receive and reply to this inquiry, for we believe that many power-boatmen do not fully appreciate the danger from "back-fires," which probably have caused nearly 100% of all the fires occurring on power boats when running. The theory of the "back-fire," as it is usually termed, is that a weak or "lean" mixture burns more slowly than a properly proportioned one, and the incoming charge of gas is ignited from flame still remaining in the cylinder from the previous explosion. The inlet valve being off its seat the flame passes back into the inlet manifold and through the carbureter gas and air passageway, the pressure generated by the ignition of the gas blowing flame out through the air inlet structure.

It is usually customary in using Schebler Model D carbureters with four-stroke-cycle engines, to have the throttle on top of the carbureter and the air valve at the side. Such an installation necessitates pointing the straight part of the air valve either upwardly or toward the boat's bilge. Any one who will give the matter any thought whatever must realize that under no condition should such an installation be made that any back-fire could blow flame into a boat's bilge, and yet there are many boats in daily use in which this potent danger exists. We are not just sure, from your description, whether your carbureter is connected to the side or top outlet, although you say gasolene leaks into the bilge between the air inlet and flange, which would seem to indicate top outlet. If this is the case be sure that the air valve points upwardly. If a piece of flexible steel tubing be connected from the air intake of the carbureter to a stove, or heating fixture surrounding the exhaust pipe, there will be no danger from fire, as there can be no flame to ignite the gasolene either in the carbureter bowl, in the boat's bilge or in a drip pan beneath the carbureter. The French Bureau Veritas, which in a measure corresponds to our National Board of Fire Underwriters, insists that every marine engine shall have not only a drip pan beneath the carbureter, but a pump to remove the gasolene, in order to secure fire insurance. You will run your engine more economically and with greater safety to yourself and other occupants of the boat, if you provide means to pre-heat the air and prevent flame from igniting "loose" gasolene. A drop of water will effectually close the vaporizing nozzle outlet and cause back-firing. The remedy for this is to strain all gasolene through dry chamois, which will prevent water entering the tank with the gasolene, and to have a water and dirt separator in the gasolene line close to the carbureter. It is also of vital importance that this separator be cleaned daily and that a few teaspoonfuls of gasolene be drawn out of the carbureter float bowl occasionally through the pet-cock put there for this purpose solely. We believe a drip pan beneath the carbureter would make any gasolene engine installation safer. Do not forget that means for fighting a gasolene fire must be present on every power boat under penalty of a fine. This is just as important as a life-preserver for every passenger and much more so than the two copies of the pilot rules each boat is required to have on board when running.

* * *

Editor of THE RUDDER:

I contemplate purchasing a four-cylinder, four-cycle, 28-h.p. Ranier automobile engine for my boat, which is a 21 by 4.10 by 18-inch draught light ½-inch planking runabout, speedy lines.

I would thank you very kindly if you will advise me if you know anything about the use of auto engines in boats. Several boatmen have told me they would not work in boats, others say the opposite. At present I have a 5-h.p., two-cylinder, two-cycle Palmer engine and can make 8½ m.p.h. at 700 r.p.m. and by using a 16 by 16 propeller.

What speed do you think I should run the auto engine and what size blade should I use? Also, if possible, what speed should I make?

New York. H. L. BROWN.

Your present engine is a Palmer Model Q-2, in all probability, which it seems to us is power enough if you are getting 8½ miles per hour with it. It is quite probable that at 700 r.p.m. you might not get as much power out of the 28-h.p. engine you have in mind, which has not been manufactured for several years, and most likely has seen its best days. If you follow our advice you will not try to use any automobile engine for boat propulsion, for you will find some extremely hard problems to solve. Marine engine manufacturers rarely offer their engines in speeds higher than 700 r.p.m. for the principal reason that they are unable to find efficient propellers at much higher speeds. If your present wheel is 16-inch pitch, the total cutting ahead, with no slip, would be

$$16 \times 700 \times 60 \div 12 \div 5{,}280 = 10.61 \text{ miles per hour.}$$

If you make 8½ miles the slip is but about 20%, which is so low as to cause a suspicion that either the engine turns more than 700, that the pitch is in excess of 16 inches, or that your speed is miscalculated. Our advice to any one contemplating the purchase or even gift of an automobile engine for use in a boat is to respectfully decline—even with thanks. Any attempt to adapt such an engine to marine use will cost a lot of time, a lot of money and a lot of fret and worry before "junking" it eventually.

THE RUDDER

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

For nearly three years the entire world has been compelled to hear, to read, and to think of war, to the exclusion of all the ordinary aims and interests of human life. Not only has war monopolized the attention of all nations, but the horrors of this particular contest exceed by far all normal conditions, bad as they were, of other wars known to modern times. Even granting that a deliberate survey in the future may disclose exaggeration in the current stories of atrocities of all kinds, the fact remains that the world at large, both neutral and belligerent, is for the time being surfeited with horrors. Whatever dim hope of peace may be discernible at the present time, there is only too good ground for the belief that the conditions existing since July, 1914, will continue through the year, and that this country will in the future be an active participant rather than a neutral onlooker.

The decline of yachting, of which so much has been written in the past ten years, exists only in the minds of those sailing men who are immovably opposed to all forms of mechanical power, and who would limit the sport to sail alone. The plain fact is that yachting is neither more nor less than the seeking of recreation and pleasure on the water; that is, by means of some sort of vessel. This definition, which is true both theoretically and practically, is independent of the fact that for several thousand years the sail was the sole means of propulsion; the steam engine with its boiler, and its more modern variants, dating back hardly more than two generations.

Taking the civilized portion of North America today, from Halifax to Key West on the Atlantic Coast and from Vancouver to San Diego on the Pacific, with the entire area inside of these extreme points, the number of yachtsmen, of yacht clubs and of yachts, and the total tonnage of the grand international pleasure fleet, is from six to ten times greater than in the most prosperous days of the sailing yacht. It is true that many of the modern followers of the sport know nothing of yachting as a national institution, nor of its glorious history, and are content to call themselves "motor-boaters" or even "motor-boatists," and to organize as "motor-boat" clubs, but the work which they are doing in long-distance cruising in small craft places them on an equality with the saltiest and most weather-hardened experts with tiller and sheet.

The high tide of sailing was about thirty years ago, when most of the great schooners of the old fleet were still afloat with many new craft of the same rig; and at the same time the great single-stickers were racing frequently for the America Cup. Even in those busy days, when the interest in the sport was keen and wide-spread, there was neither the demand nor the opportunity for yachting news which exists today. The yachting public is far greater in point of numbers, it is distributed over an infinitely greater and more diversified area, and its interests cover a vastly broader field, especially in the line of marine engineering. It would be an easy matter today to fill a weekly magazine of the size of THE RUDDER with a variety of interesting yachting matter—club, personal, racing and general news, cruises, illustrations and technical articles; it is not merely difficult but absolutely impossible to do justice to the many phases of the sport within the limits of a monthly publication.

Whatever the future may bring in the way of war, we believe that there are many who will still be interested in yachting; and who, in particular, will appreciate a publication to which they may turn for something other than bloodshed, disaster and strafing. We feel that even the most patriotic yachtsman will be able to find all the war that he may want under the big headlines of the daily papers, inside the blue, white, pink, green or yellow covers of the different governmental publications, and in the growing multitude of war books; and that he will turn with relief once each month to a magazine which brings to him nothing but matter immediately associated with his favorite sport.

That there must exist an intimate connection between war and yachting is most deplorable; apart from the interruption to the sport—which, it is to be hoped will prove but temporary—there is the more mischievous and lasting effect of the influence on design and type, producing craft which are lacking in all the essentials of a yacht and yet fail to make useful war vessels. The mobilization and training of yachtsmen, the conversion of yachts to war uses, and the performance of the auxiliary fleet thus created, are vital matters at the present time; but we believe that they relate to war rather than to sport. The work of those yachtsmen who will be in the coast patrol will furnish much interesting reading matter and the performances of their yachts and engines will give valuable data for students of model, design and power. Articles of these subjects will be published but more space will be left for that class of yachting news which long experience has proved to be most acceptable to the readers of THE RUDDER.

The supplement of THE RUDDER this month is the steam yacht Arcady, owned by Arthur Meeker. This yacht will in all probability be one of the big fleet now being prepared for coast patrol duty. The Arcady was built in 1898 by Samuel Pine, Brooklyn. She was then known as the Osceola and was designed by Gustav Hillman. Her general dimensions are 140 feet over all, 116 feet on the water-line, 17 feet 11 inches breadth

and 9 feet draught. She is driven by Sullivan compound engines and has Scotch boilers.

Those yachtsmen who took enough interest in the sport to study navigation and boat-handling, instead of taking things easily and relying on some paid professional captain or some more enthusiastic friend, are finding out that just sailing around a triangle does not give experience enough to enable them to qualify with rank in the Naval Coast Defense Reserve. While on the other hand those who handled their own yachts, particularly the power yachts, and who made extensive cruises or participated in the long-distance races, such as those to Bermuda, Marblehead, and Havana, have passed examinations and gained commissions of ensign, lieutenant, and in some instances lieutenant-commander, and they are competent to take commands in the first line of defense. The war will probably have a stimulating effect. Already many very capable small-boat handlers have enrolled but will serve as seamen; but with their experience and ability to acquire knowledge they will study and later on pass examinations and thus earn promotion. After the war is over navigation will be studied by all who own yachts. It is not a difficult study and in a very short time the average yacht owner should be able to gain a master's and pilot's certificate. Many yacht clubs will doubtless arrange for classes during the Winter months when the owners can study and, what is more important, long-distance races for staunch and seaworthy boats will be arranged in order that those who take part in these races may gain much practical experience.

A fleet of three hundred and forty-five patrol boats, each 110 feet long, is now being built as fast as possible. Of these one hundred and thirty-five are to be built in the Navy yards and two hundred and ten in private yards. If all goes well—and there is some doubt about this in the minds of many who know,—this fleet will be ready for service by the end of the present year. The boats built in private yards when completed and ready for service will cost about $100,000 each. Those built by the Government will cost much less because by the Government's system of bookkeeping only the bare cost is considered and then the Government has facilities for purchasing materials at much lower rates than private builders.

The winners in the designing competition for a fishing boat are announced in another part of this issue of THE RUDDER. The plans submitted all show merit and the designers are to be congratulated on the thoroughness of their work. Many plans have been received for the other competitions and as soon as possible these will be passed on by the judges and the results announced. The competition was a distinct success.



Spokes from the Rudder Wheel

U. S. Senator Peter Goelet Gerry, of Rhode Island, son of former Commodore Elbridge T. Gerry, of the New York Y. C., is prevented by red tape from tendering his yacht to the Government for use in the war. When he offered the yacht Owera to the Navy Department he was told that he would be subjected to a heavy fine, according to the present laws, because it is unlawful for a member of Congress to be a party to a contract with the Government. The Owera was offered free, but a contract is necessary. Senator Gerry has introduced a bill which if passed will enable him to give his yacht to the service of his country.

* * *

The Thousand Island Y. C. Championship Challenge Cup Races will be held at Alexandria Bay on August 8th, 9th and 10th.

* * *

President John R. Brophy of the Yacht Racing Association of Gravesend Bay is enrolled in the Naval Reserve, Fourth Class, with the rank of ensign.

* * *

Former Commodore Arthur Curtis James is having the bark-rigged yacht Aloha fitted out for defense work.

* * *

The Harlem Y. C. will go in commission for the season on Saturday, May 12th.

* * *

The Government has announced the closing of many harbors at sundown. This will, of course, somewhat interfere with yachting, but the Sound is large and it will be closed to navigation at the Eastern end, New London, and at Execution Rock. Between those two points there is lots of room for the small craft that will be used this Summer.

* * *

Rear-Commodore Leonard H. Dyer's 60-foot power yacht, Atlantis, is now equipped with a six-cylinder, Model F Sterling engine. The Atlantis is enrolled in the Coast Defense Reserve, in which class Commodore Dyer is very active, and she will prove an exceptionally good boat for this work.

* * *

Charles Allison, a member of the Royal Norfolk and Suffolk Y. C., is in New York on Government business. Mr. Allison has seen much of the service on the fighting line and he has been out in the 80-footers which were built for patrol duty. He says they are fine boats and have done exceptional work under most severe conditions of sea and storm.

* * *

Daniel Good, of Buffalo, has enrolled the 110-foot power yacht Elmasada II in the coast patrol. This yacht is driven by Sterling engines and makes 19 miles an hour.

* * *

Arthur Marks, owner of the power yacht Aramis, which is now having the finishing touches put on at Jacob's, has received a commission as lieutenant in the Naval Reserve and is in the construction department.

Commodore George F. Baker, Jr., found that his steam yacht Viking was not just suited for Naval service and so he has purchased the Wacouta, formerly owned by the late J. J. Hill, and has presented that to the Navy. The Wacouta has been fitted out and is now waiting her guns. She will be manned by a crew of Harvard undergraduates.

* * *

The Corsair, Vice-Commodore J. P. Morgan's steam yacht which he presented to the Navy, is now wearing her coat of gray paint and is almost ready for service. Captain Porter will have charge of the yacht and former Commodore Robert E. Tod will be executive officer and Junius S. Morgan will be ensign.

* * *

Drake Sparkman, son of James D. Sparkman, of the New York and Larchmont clubs, has enrolled and is a coxswain. He established a recruiting station at New Rochelle and in a few days got ten enlistments for the Navy.

* * *

Commodore James B. Ford's schooner Katrina will be in commission this month and the commodore will live on board as usual during the Summer with headquarters at Larchmont. His sloop, one of the one-design class building at Woods yard, is to be named Varuna and will carry a Marconi rig.

* * *

The New York Y. C. at a special meeting recently dropped the German Emperor and Prince Henry of Prussia from the roll of honorary members. The Atlantic Y. C. did this a few weeks ago.

* * *

The Eastern Y. C. has offered its clubhouse at Marblehead to the Government for any use it may wish and the members of the Corinthian Y. C. at Marblehead have subscribed $20,000 with which to build a patrol boat.

* * *

The Susanne, a 76-foot power boat, owned by E. H. Close and used on the Lakes, has been enrolled in the patrol squadron. She is equipped with two 300-h.p. Sterling engines and can make 25 miles an hour.

* * *

Commodore Percy C. Jones of the Maumee River Y. C. came to New York recently to purchase one of the new 52-footers built by the Gas Engine & Power Co. Commodore Jones offered to purchase the boat, equip it and put it on patrol work if the Navy Department would accept his offer. For some reason or other the Department did not give much encouragement to this offer and so Commodore Jones went home and the boat was not purchased.

* * *

A. J. Mitchell, advertising manager of the Sterling Engine Co., died very suddenly last month. Mr. Mitchell had been identified with the company for eight years and was at one time manager of its service department. His death is a loss to the Sterling Co., and he will be missed by the hosts of friends that he had made.

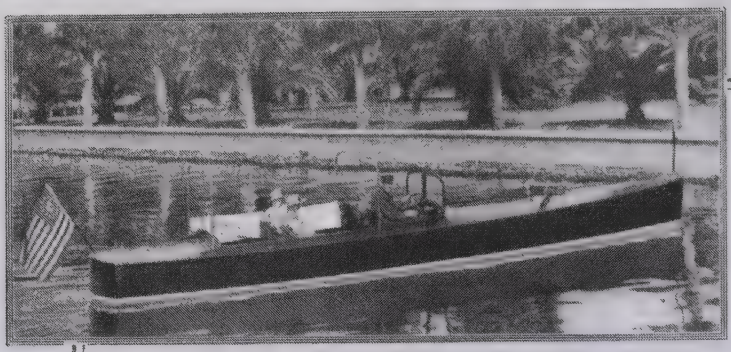
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A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII June, 1917 No. 6

The British 80-Foot Patrol Boats

THE story of the building of 550 patrol boats for the British Government will go down in history as one of the big achievements of the war. It is particularly gratifying to all that this big piece of work was accomplished by an American corporation and was worked out in all its details, from the designing of the hull and engines to the purchase of small pieces of cotton line for lashings, by American brains. It was a tremendous work well done. It was big because of the immense amount of thought and detail necessary and because of the enormous quantities of materials that had to be procured to build and outfit the boats.

It is singular that the British should have gone to the Electric Boat Company for this work but it was natural to assume that those who were vitally interested in the development of the submarine should through their close association with that boat know its weaknesses and how it could be successfully combated.

These 80-foot patrol boats were built by the Elco Company which is part of the Electric Boat Company. Its small plant at Bayonne had in former years been used for building yachts and launches. It came to life at the time of the Columbus celebration in 1893, and then had a concession to run electric launches on the lagoons at the World's Fair at Chicago. From that small beginning it has grown wonderfully, and while it is now a part of the Submarine Boat Corporation it was really the beginning of that organization.

The work done by the Standard Motor Construction Co. under the direction of Eugene A. Riotte was also remarkable, 1,650 engines being built in record time.

Henry R. Sutphen's was the master mind in all the work. He arranged the contract and then with efficient aid worked out all the details. He has told the story and it is given in this issue of THE RUDDER with illustrations from photographs by Mr. Rosenfeld.



Victory, Named for Nelson's Flagship, the Master Boat Which Set the Standard for the Huge Fleet of 550

The History of the Big Work

By Henry R. Sutphen

IT was in February, 1915, that we had our initial negotiations with the British naval authorities. A well-known English shipbuilder and ordnance expert was in this country, presumably on secret business for the Admiralty, and I met him one afternoon at his hotel. Naturally the menace of the German submarine warfare came into the discussion; we both agreed that the danger was a real one, and that steps should be taken to meet it.

I suggested the use of a number of small, speedy gasolene power boats for use in attacking and destroying submarines. My idea was to have a mosquito fleet big enough to thoroughly patrol the coastal waters of Great Britain, each of them carrying a 13-lb rapid fire gun.

I explained that I had in mind two distinct types. The first would have an over-all length of about 50 feet, and would be fitted with high-speed engines; such a boat would show a maximum 25 knots. The alternative would be something around 80 feet in length, with slow-turning engines and a speed of 19 knots. I added that my own preference was for the larger and slower type.

He asked how many units of that class we could build in a year's time, and I told him that I could guarantee fifty. He said that he would think the matter over, and we parted.

Well, I had to think things over myself and pretty carefully too. Our yard, in addition to its smaller work, had been turning out perhaps half a dozen boats a year of the general dimensions that would meet the requirements. Now, very possibly, I might be called upon to build, say, eight times that number, and many factors had to be taken into the account. Needless to say, I had no idea at this time of the truly tremendous task that lay before me.

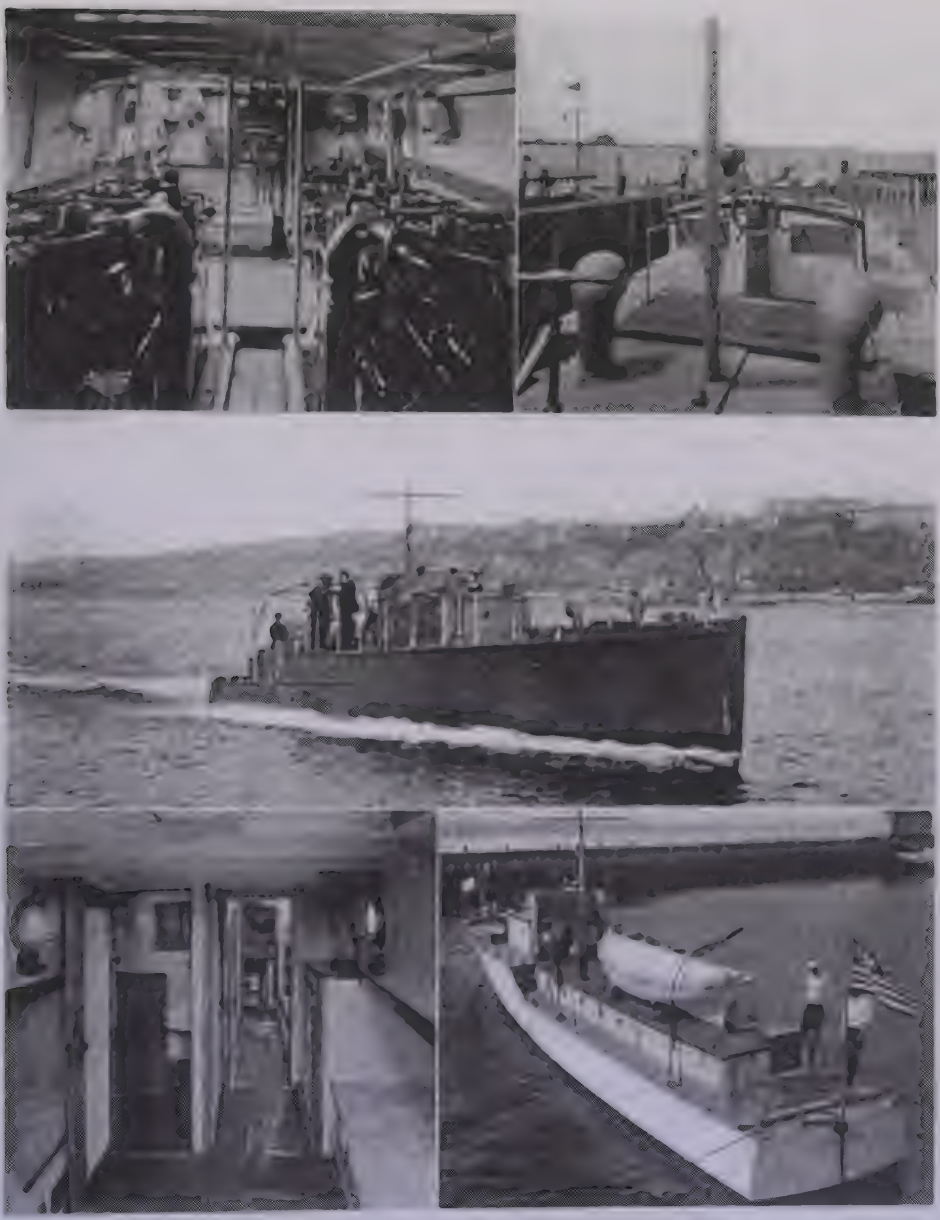
As I looked at it, there was just one answer to the problem, and that was, complete standardization. Fortunately, I had had some previous experience along that very line. Away back in 1893 our company had taken the contract to build fifty electric launches for use at the Chicago World's Fair. The undertaking was successfully accomplished, establishing the fact that boat-building on the quantity production line was practicable. Then, in 1904, we built one hundred and twenty 20-foot wooden yawls for the Quartermaster Department of the United States Army for use in setting submarine mines. Later on, we constructed, also for the Army, two 45-foot steam launches, four 60-foot steamers and thirty-two "junction-box" launches, complete with engines, for mine-planting work. All this was valuable experience, and the idea naturally presented itself that the duplication principle could be extended to pleasure craft. This was a distinct innovation in the boatbuilding business, for it had always been assumed that the man who wanted a yacht, or even a day-boat, would insist upon having his individual preferences carried out, particularly in the matter of galley and cabin appointments. This meant that virtually every pleasure craft was constructed to special order and at a proportionate expense. I went on the theory that if our designers could hit upon a plan and model that would appeal to the average man we could build that type of boat on a quantity production scale and find a market for it. We tried the idea out on our "Express" launches and it took; we followed it up with our "Cruisette" and "Cruiser" types, and they too have become remarkably popular; we found that we were giving the public something that they have always wanted but never before could get. And the secret was in one word—standardization. As I have already said, this past experience was now to prove of immense value and assistance; without it, indeed, I doubt if we would have dared to take on the big thing that was coming our way.

A few days later I had another interview and was told that the British Government was ready to give us a contract for fifty vessels of the larger type, the whole lot to be delivered within a year's time. Then arose the delicate question of how the job could be pushed through without embarrassing our own Administration, then maintaining its position of strict neutrality. Obviously Canada offered a convenient field of operation, and we went up to Montreal to investigate. We met and talked with several men in the shipbuilding line, but we could not seem to find any plant that would meet our requirements. Then we heard of a small repair yard near Quebec, and we went over to see it. It looked pretty rough and badly appointed and the gray, sullen surface of the river, filled with drifting ice, presented a most forbidding spectacle. But the owners of the yard showed a willingness to cooperate in every way; moreover, they assured us that the big Spring tides would be of distinct assistance in the launching of the boats. And conditions in the labor market were satisfactory. The upshot of the business was that we took an option on the property, one more forward step.

On April 9, 1915, the contract for fifty "chasers" was signed, and we went to work so diligently that by the first of May the master or pattern boat was in the frame at our Bayonne yard. It seemed to us like a big undertaking, but the real business had not even started.

The Lusitania sailed on her last voyage May 1, 1915, and a week later her torpedoing by a German U-boat was reported. My English friend was sailing that same day from New York, and we were giving him a farewell luncheon at Delmonico's. When the appalling news was communicated to him he appeared much depressed, as indeed was natural enough, and also very thoughtful. Before he said good-by he intimated to me that he intended advising the Admiralty to increase the number of "chasers"; he asked me if I thought I could take care of a bigger order. I told him that I would guarantee to build a boat a day for so long a period as the Admiralty might care to name.

After he reached England, we shortly received a cablegram ordering five hundred additional "Sutphens," our code word for submarine "chasers"; in other words, we were now asked to build five hundred and fifty of these boats and deliver them in complete running order by November 15, 1916. Taking out Sundays, this would



Top—Engine Room With Two Standard Engines. Steering Bridge
Center—Quartering View of Boat Running
Bottom—Officers' Quarters. Deck View of One of the First Fifty

give us an actual working schedule of five hundred and one days. This meant pretty close figuring, but I was sure we could manage it.

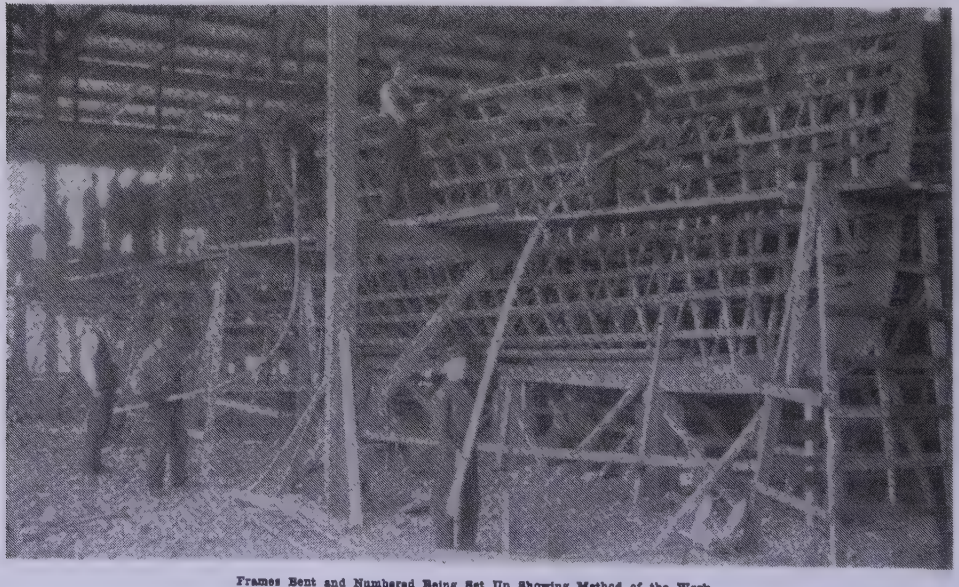
On July 9, 1915, the new contract was signed. Of course, we would now need to increase our Canadian assembling facilities, and we therefore leased a yard in Montreal and materially enlarged the original one at Quebec.

Once again I must reiterate that the touchstone of our success was scientific standardization. Our chief designer, Mr. Irwin Chase, was quick to recognize this essential, and his keen foresight and far-reaching judgment were all-important factors in the practical realization of our ideas. For this new task involved duplication on a hitherto unheard-of scale, and every mistake would be magnified five hundred and fifty times; this meant that we could not afford to make even a single error in plan or practice. For instance, there was the question of material; where could it be found in sufficient quantity and of proper quality? White oak enters extensively into ship construction and the supply in this general locality is just about exhausted. Finally we found it in West Virginia and the contracts were let without delay. Also yellow pine would be needed, and there was but a limited supply in the local markets. Fortunately, the mills in the South were anxious for work, the war having destroyed most of their export trade, and they were glad to take our orders and to guarantee prompt delivery of the highest grade, long, straight stock, absolutely free from knots and sap, the finest lot of selected lumber that has ever come out of the Southern woods. Just to show what thought had to be given to every detail, it was specified that the longest plank must not exceed 42 feet. The reason was that the lumber would have to be shipped in end-door box-cars, and the longest in general use measured only 43 feet.

Another consideration was where to get the castings for the metal work. The foundries that ordinarily handled our orders could not possibly turn out the quantity now called for; it became necessary then to hunt up other plants not hitherto engaged in shipbuilding work, and enlist their cooperation. And this we did; for example, the Tiffany Studios took the contract for casting the bronze struts and fittings used to hold the shafts, quadrants, and rudders. Before this, the Tiffany Company had turned out only work of the ornamental and artistic kind; but they knew how to make bronze castings, and they were glad to get the order for a duplication job of this magnitude.

The bending of the frames, assembling keels, beveling planking, and indeed all of the fabrication work, was done at our Bayonne yard, the two Canadian plants being used only for assembling. This made it imperative that the big pieces, such as the planking and keel frames, should be kept within the railway clearances for bridges and tunnels on both the American and Canadian lines. On account of the contracted dimensions of the Whitehall tunnel we were unable to ship over the Delaware & Hudson Railway, and the material, all in knockdown form, had to go via Suspension Bridge and Buffalo. In the aggregate this amounted to three thousand carload lots.

Our plans were made so carefully and checked so thoroughly that once the work started it moved along with the utmost smoothness and precision. As Mr. Chase used to remark to me: "We are making every hurdle and batting 1,000%." And this was true, thanks to Mr. Chase himself and to my other associates, notably Mr. Thomas S. Hanson, General Manager of the Bay-



Frames Bent and Numbered Being Set Up Showing Method of the Work

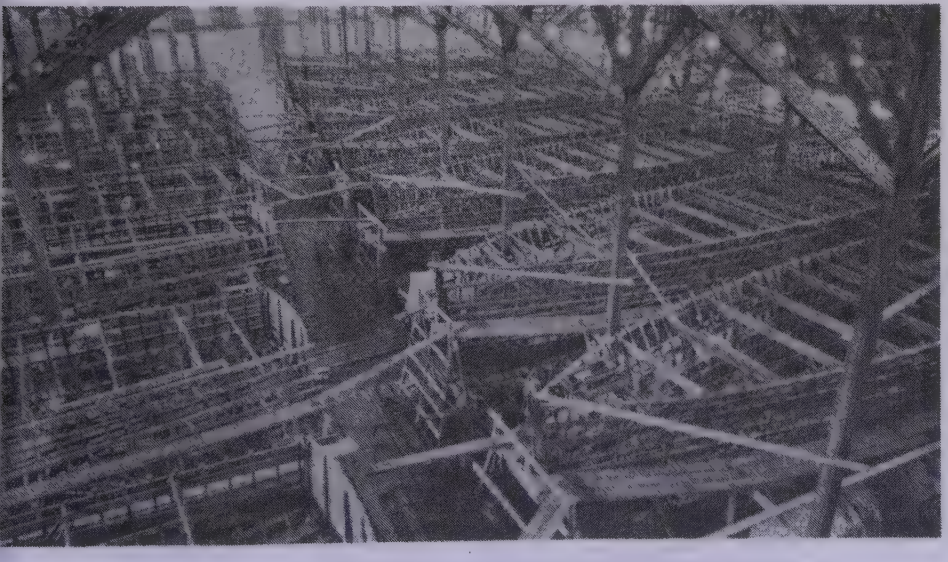
onne plant; Mr. E. B. Conrad, the Purchasing Engineer, and Mr. Charles Lamont, Chief Boat Constructor. The whole success of the enterprise was dependent upon their brains and loyalty, and indeed I am proud to say that no one in our whole employ failed to do his utmost duty; small wonder then that we succeeded in our task.

The fabrication work at Bayonne involved some peculiar problems. For example, there were the beveling and the hollowing of the planking, also the grooving of the caulking seams, operations usually performed by hand. Obviously we could not spare the time to do this sort of thing, literally by the mile, in the ordinary way, and so we devised machines to take the place of hand labor. This could not have been practicable, of course, except for the fact that we were building five hundred and fifty boats all exactly alike.

The big job was the making of the templates, moulds and patterns for the first or master boat. After we had these right the rest was merely a matter of duplication. Bear clearly in mind that everything had to be fabricated in Bayonne, and it had to be absolutely correct in every particular. The men at Montreal and Quebec, who put the boats together, were only ordinary wood workers with hardly a boatbuilder among them; moreover, only 3% could speak English. And yet, under the direction of our experts from Bayonne, they did the final work of assembling with the greatest possible ease and despatch. No cutting, shaping or fitting of any kind was necessary. Mould frames, plank-sheers, joinerwork—all were made to exact pattern and fitted in like the "dissected locomotive" game of our childhood days. Only there was no puzzle in the process, for every separate piece was lettered and numbered, and so went precisely and easily into its appointed place. At the Bayonne yard elaborate production charts were kept, showing at a glance the progress of the manufacturing. Thus we prevented shortages in one direction and surpluses in another; these charts were the balance wheels that kept the work going at a steady and uniform pace.

Let me enumerate again just what we had to do. We had contracted to deliver to the British Government five hundred and fifty 80-foot power boats, engined with twin engines rated at 220 h.p. apiece, and otherwise completely equipped; also we guaranteed them to be capable of making 19 knots taking the running time of one hour, and to maintain an average of 15 knots for a 4-hour trial, the fuel consumption not to exceed a given amount. Work had started April 9, 1915, and the full number had to be ready on or before November 15, 1916. As there were only five hundred and one working days in this period we would have to turn out more than a boat a day. This was the task that we undertook to accomplish and that we did accomplish and with something to spare. For the original order of fifty boats was cleaned up in November, 1915, four months ahead of time, and the whole lot was delivered by November 1, 1916, giving us a whole fortnight's leeway. The total number of working days (Sundays being eliminated) was, therefore, four hundred and eighty-eight, and the mathematically inclined reader may figure out for himself just how much better than "one boat a day" we had to do. There were times indeed when three boats a day were going into the water.

Every business enterprise has its moments of romance, and we got our thrills in the assembling work at the Canadian yards. In the first place, climatic conditions were not favorable. The snowfall around Quebec runs from 15 to 18 feet, with temperature going as low as 40° below zero. We had to erect suitable buildings to protect our workmen against the biting winds, the



Setting Up the Frames in the Shops at Quebec. Fifteen Boats Are in This Group Ready for the Planking

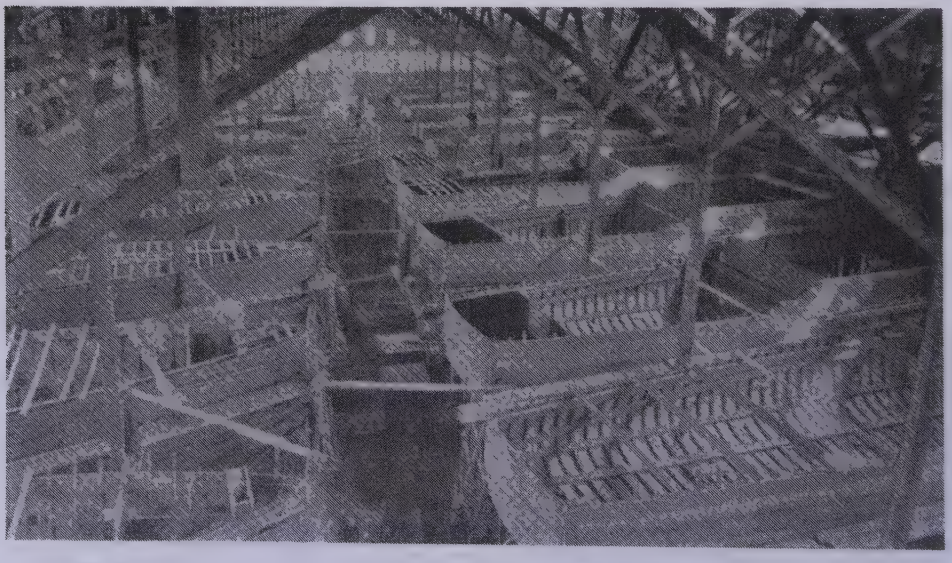
rain and the snow, and our two assembly buildings measured 600 feet in length by 200 feet in width. The roofs were constructed after the approved Canadian formula, so that they could be quickly cleared of snow. Large spaces had to be provided for the storage of the displaced snow; finally, it would be piled on flat cars and taken outside of the yard for dumping. Of course we had railway tracks running in every direction through the plant.

According to the terms of our contract we were to make all deliveries at the launching slips in the St. Lawrence River, and the Admiralty wanted as many boats as they could get before the close of navigation in late November. We gave them the first fifty and then came the ice and stopped us. The Admiralty overseers suggested that boats might be shipped by rail to Halifax, an open port, and tried out there during the Winter months. We agreed to this, provided that the railway could handle the complete boat. Thereupon we constructed a skeleton model of a "chaser." It looked very much like some extinct prehistoric monster, a mastodon or a "terrible lizard," and I have no doubt that more than one rural Canadian gentleman, after watching the train pass in the early twilight, was forthwith constrained to cut John Barleycorn's acquaintance. Talk of "seeing things by night!"

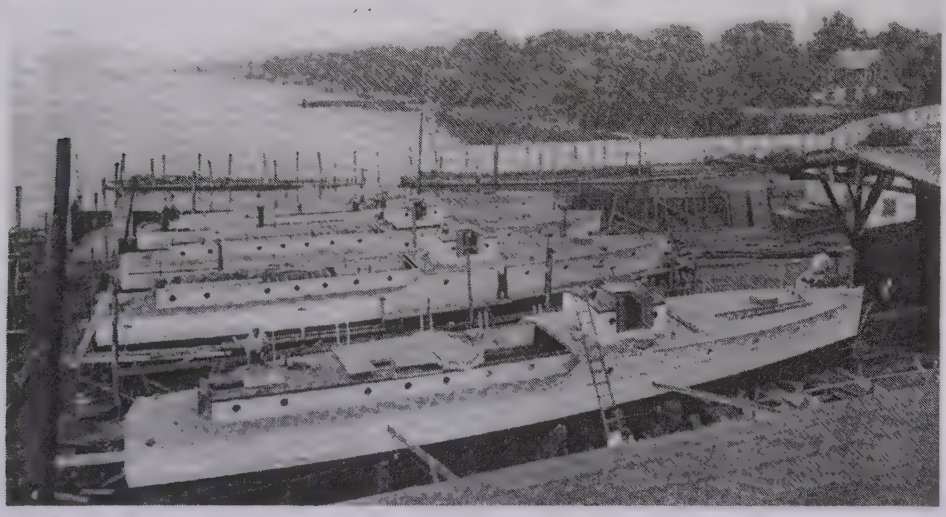
This fearsome "trial horse" was mounted on a lumber car and sent over the thousand-mile stretch of railway between Quebec and Halifax. Trained traffic inspectors accompanied the car and noted the difficulties encountered. Fortunately, there were no tunnels on the route, but a number of semaphores and switch standards had to be moved, and, in several instances, the track at way stations had to be shifted a few feet to clear the platform. But this sort of work was quickly accomplished by the railway men, and we, in our turn, set about remodeling our assembly shops to meet the new conditions. Standard gauge tracks were laid so that the flat cars could stand directly under the stocks. The keel blocks were set high to clear the cars, and when the boat was ready it could be lowered directly on the flat and run out to the siding. Complete with engine and other equipment, the boats weighed about twenty tons, and never before had it been thought possible to transport vessels of this size by rail. Every "chaser" was carried on a 60-foot Northwest lumber car, with trailers at each end to take care of the overhang. By Christmas, 1915, we were shipping eight or nine boats a week and there was not a single accident or indeed any noteworthy delay. The boats stood the strain of the long trip without developing any structural defects, and, on their arrival at Halifax, they were at once put overboard, given their trial trip, and loaded for transshipment to England. In all, eighty-four boats were sent over the rail route, shipments being discontinued in later February, 1916.

The experience thus gained was of material value when the big Spring push came on. We knew now how to handle the boats with ease and certainty, and once the transports were in the river the work of loading and forwarding went on without a break. By the end of May some two hundred boats had been delivered, together with an immense quantity of spare parts and other extras.

In one sense, quantity production may be called a monotonous process—parrot work, as it has been dubbed. But in another way, it is fascinating; it reminds one of the progress of an army, the several units all marching in perfect order to make up one irresistible whole; the very magnitude of the job produces an overwhelming



Various Stages of Construction. Those in the Foreground Are Planked and Others Have Bulkheads in Position, Tanks Placed, Decks Laid and Each Has Its Engines Underneath



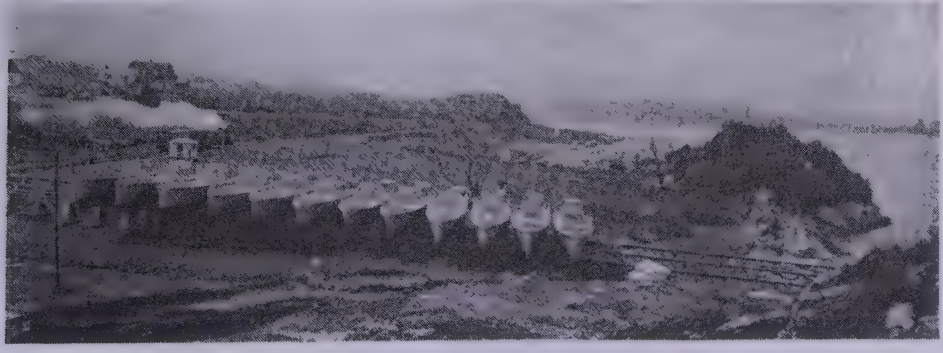
Boats in the Basin at Bayonne Having Deck Fittings Put On and Receiving Finishing Touches

impression of force and energy. At Montreal there were forty sets of stocks and at Quebec there were eighty, all in continuous operation. We also used the Duke of Connaught dry-dock at Montreal for assembly work during the Winter of 1915-16. The dock is 1,000 feet long and 125 feet wide, and it had to be roofed over to protect the work and the workmen from the elements. Thirty boats were put together here, and in the Spring the dock floor was lowered and the whole lot floated at once, probably a record launching of its kind.

The routine once established was vigorously maintained, each department concerning itself solely with keeping up its particular end. There were the draughtsmen; the men who looked after the purchasing and ordering of material and supplies; the constructors at the Bayonne yard, intent upon keeping up their daily allotment of fabrication work; the railway "tracers" who followed the car shipments through to destination; the erectors at the assembly yards; the launching organization; the trial crews, who tested out the finished boats and remedied any slight defects that might appear; and finally the British Government overseers, keen to watch every step of the long process.

Once the boats were launched there were innumerable difficulties to be met and overcome. With the Spring floods the great river was filled with driftwood, much of it waterlogged and, therefore, invisible. No material damage was done to hulls, shafts or engines, but many propeller blades were nicked and bent by collision with submerged logs and this, of course, necessitated replacements.

The testing out was thoroughly systematized. Every



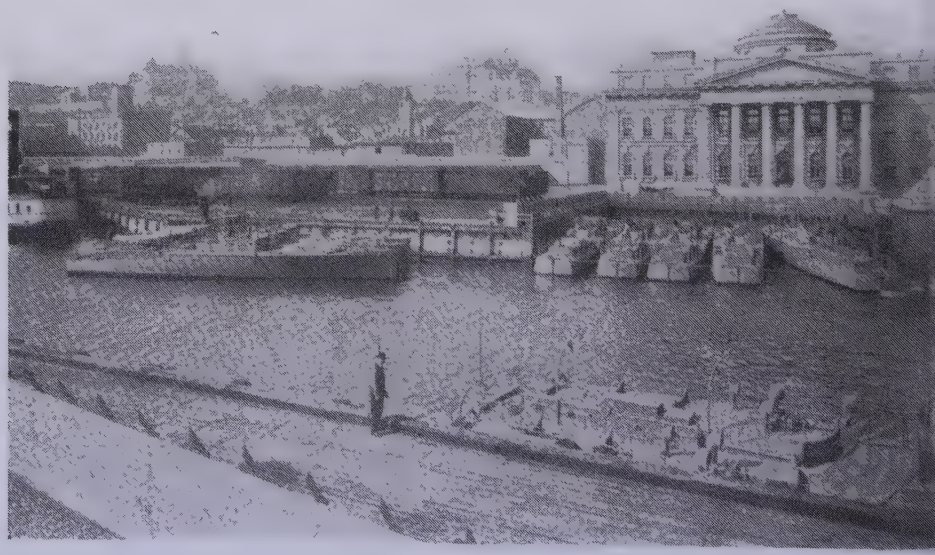
At the Davie Ship Yard, Quebec, the Boats Were Launched Broadside After Being Run Out of the Shops

boat, running over a carefully measured trial course, was expected to come up to certain definite standards, and one boat out of each batch of twenty-five was put through a special and rigorous trial. The "chaser" in an hour's run would have to show an average of 19 knots, carrying full fuel tanks and the extra weight equivalent to what would be her complete service equipment, the displacement being 32 tons. Then followed a 4-hour test at an average speed of 15 knots. The fuel consumption was carefully noted, the contract providing for severe penalties in case the maximum allowance was exceeded. What better tribute can be given to the excellence of our work than the bare statement that in every instance the guaranteed speed was exceeded, and at a lower rate of fuel consumption than we had promised! Moreover, no structural defects developed, thereby proving that our designs and specifications were correct. Take one item alone—gasolene tanks. In all, there were twenty-two hundred of these, having a total fuel capacity of 1,320,000 gallons. There were no leaks of any moment and none of the tanks had to be condemned by the inspectors. The engines, aggregating some 275,000 h.p., were given a severe tryout both on the test stands and in the boats. Every one stood up, and the fact reflects great credit on the builder, Mr. E. A. Riotte, President of the Standard Motor Construction Company. Many difficulties were encountered, but the supply of engines never failed us. A certain number had to be built by other plants, according to the Standard specifications; and our own affiliated organization, the New London Ship & Engine Company, handled the bulk of this outside work; that no delays occurred was due to the able direction and oversight of Captain Cable.

After the trials the British overseers took formal delivery by signing the inventory book and receiving the one hundred odd keys, for lockers, cupboards, switchboards, etc., that went with each boat. Then the "chaser" was towed away to the storage basins. These had to be made large enough to accommodate a goodly number of boats; otherwise there might have been delay in loading the transports. Each ship carried four "chasers" and in all a fleet of one hundred and thirty transports was required to take over the five hundred and fifty boats and the vast quantity of spares and standardized parts. Every one arrived safely.

Mr. Chase was in England during the Winter of 1915-16 and knew nothing about our rail deliveries to Halifax Harbor. Consequently, he was very much surprised one day at being informed by the Portsmouth Navy Yard authorities that a shipload of "chasers" had arrived. He was asked how soon a demonstration could be given, and in turn the Englishmen were surprised when Mr. Chase announced that he would be ready two days after the first boat was put in the water.

The demonstration was satisfactory to the Admiralty, and the boats were put into commission as fast as they



Panoramic View of Point à Carey Basin at Quebec In Front of the Custom

were received. But the Britisher always maintains his constitutional right to grumble, and at first there were many complaints of the cramped accommodations furnished by the "chasers" for the captain and eight men crew. I cannot better illustrate this state of mind than by quoting a set of verses entitled "Song of the Sea Slugs," sent to me by some anonymous British bard. These are printed elsewhere.

But this is now ancient history and the "chasers" have so distinctly made good that the carpers have been completely silenced; in fact, the crew are proud of their diminutive craft and of the work they can do. So far as I know, not a single boat has been lost through shipwreck, and such is their seaworthiness that the "chasers" frequently remain three or four days 100 miles offshore, and in heavy weather at that. Their low visibility, together with their speed and mobility, have made them well fitted for their work against the submarine. Three or four of these boats are assigned to every British harbor, and they are used for a multiplicity of purposes, such as rescue work, mine sweeping, patrol duty, and general utility.

It has often been asked why a larger type of boat was not built for this particular work of submarine chasing. The answer is that, everything considered, I felt the 80-foot boat to be best adapted to manufacturing possibilities, where large numbers and early deliveries were desirable. Moreover, we could not have sent larger boats over the rails to Halifax, nor indeed had loaded them for transatlantic shipment. In the average transport at our disposal the shipping space on the main deck, between the forecastle and bridge, and the afterdeck room did not measure more than 85 feet. All these factors had to be taken into consideration; otherwise, we might have found ourselves in the predicament of Robinson Crusoe, who built himself a fine, big boat, so big and fine that he was never able to get it into the water at all. Our job was to devise a craft that could be used in combating the submarine terror; to duplicate it in sufficient numbers, and within the shortest possible period of time; and finally to deliver the goods where they were wanted. It was a challenge to the American way of doing things, and I am glad to say that we were successful in meeting it.

In addition to those mentioned before as materially assisting me in the construction of the Elco submarine chasers, I cannot close without referring to the loyal support, technical views and administration services rendered by Mr. P. L. Miller, the General Manager of the Canadian Vickers, Limited, Montreal, and of Mr. George Davie, General Manager of the Davie Shipbuilding & Repairing Company, Limited, of Quebec, Canada. Both of these gentlemen rendered invaluable service in the accomplishment of this task by their personal encouragement throughout the work and their ability in directing and overseeing the work done by their respective plants.



House Where the Boats Were Stored for Finishing Touches Before Trials

The Power Plant and Its Problems

BUT what of the manufacturing of the 1,600 odd engines which made up the power equipment of the fleet of submarine chasers?

The two main propelling engines were 220-h.p. air-starting and reversing Standard engines. Just stop to think of the origin of the rating—horsepower—and realize that each engine is doing the equivalent of what 220 horses can do, and this power in each engine is so perfectly controlled that it is put to instant work and brought to instant rest through the mere touch of a finger. This responsiveness, which makes this powerful machine the abject slave of the operator, is accomplished through the perfect balance and synchronism of over 3,600 engine parts, so completely finished and coordinated that the work which the men in the engine room have to do is comparatively simple.

An epoch in marine engine design was born with the conceiving and evolving in the brain of C. C. Riotte of an engine which would start by itself through the mere touch of a finger, which would stop dead from full speed and which would reverse its running practically instantly from full speed ahead to full speed astern—an engine which accomplished what the steam engine did without the steam engine's faults.

Picture the mastery of mind which could so grasp every individual part and movement as to bring about the final accomplishment in the simple and practical way of the Standard engine.

But think of the knowledge gained of experience necessary for mobilizing the forces to produce the 1,600 odd engines called for; the understanding of many things of varied character, some included in the arts, some in the sciences as well as the many in the so-called trades of industrial America. A hand had to be stretched to the North, to the South, to the East and to the West, and the entire country honeycombed; to the iron ore mines and the copper mines to the Northwest, the coal mines and steel mills to the Southwest, the big machine tool plants of the East and West, etc.

The one order received by the Standard Motor Construction Company made it necessary for that company to arrange with over 200 other firms for a part or a whole of their product. Several times the crank shaft market of the country was unconsciously cornered by the Standard Company.

Over 2,930 tons of cast iron alone were used in building these engines, about 140 carloads of iron or 10 full train loads of 14 heavily loaded freight cars. About 2,200 tons of steel alone were used for these engines, or over 7 full train loads of 14 heavily loaded cars. Over 474 tons of phosphor bronze were used or 2 train loads of 14 heavily loaded cars. Over 390 tons of brass were used which means about 20 heavily loaded freight cars, filled with brass. Over 115 tons of copper were used or 5 freight cars filled with copper. Just think what that means, and besides these a whole freight car of aluminum was used to say nothing of the tons of miscellaneous material, galvanized iron, etc. Placed in one train these cars would reach almost three miles from the Standard factory's door. If they had to be handled one at a time almost a year would be consumed in unloading them.

Besides the knowledge of knowing just what was needed; what kinds of material, what varying grades of material, where obtainable, think of the generalship required at the center of operations for seeing that all of



Eugene A. Riotte, Who Marshaled the Forces of the Standard Company in the Building of the Power Equipments

this mass of material was gotten off at the right time and shipped properly, to say nothing of that generalship of shop forces which eliminates lost motion; which so directs every movement as to have each carload of raw material come in one end of a building and go out the other end a highly finished piece.

Think of the thousands and hundreds of thousand operations where a variation of a fraction of an inch could not be disregarded, where every part must fit into every other part so perfectly that the whole runs as a gigantic, perfectly timed clock.

An army of several hundred highly skilled artisans, trained to army precision, each man having his work to do and every man's work so laid out for him as to give a continuous uninterrupted progress of each part from the time where, in its raw state, it enters the first man's hands until it is assembled into the engine with Standard precision of movement and fit. This army of men was divided into two divisions. One division started work at 7 o'clock in the morning and worked until 6:30 o'clock at night having only taken a half hour in the middle of the day for eating lunch. The second division started work at 7 o'clock at night and worked until 6:30 in the morning having taken a half hour in the middle of the night for lunch.

Working at the same high speed of production at which this army of several hundred men turned out these 1,600 odd finished engines it would take one man 428 years of full working days to build these same engines. Of course, in reality the work couldn't be done.

If it were only possible for everyone to go through the Standard factory, so as not only to see on the surface of what goes on, but to see and understand the full scope of the work; in other words, to go through the factory and feel the touch of every department and man in the organization that each smallest part feels in its execution and delivery. You would find that where necessary for judgment to be passed, the matter comes up immediately before the particular department, and even to the executive officer where final decision is to be made, and that only the efficiency of production through organized manufacturing could accomplish the tremendous task of building the 1,600 odd finished engines in the record time established.



Scenes in the Standard Plant

Top—Laying New Engine Bases
Assembling Auxiliary Sets

Making Parts in the Machine Shop
Setting Up the Engines

It is interesting to start in the Engineering Department and see how carefully and effectively the Standard plans and drawings for the factory organization are worked out. Then to follow these drawings to the Pattern Shop where the workers build from them a wood or metal form for the foundry man, who then transforms this into the rough casting of iron, steel or bronze, which together with the forgings for other rough material is delivered to the Tooling Department. Then it is a marvel to see how the machine men, one after another, take it and shape it; and no operation, no matter how elaborate, is avoided even where the first cost of a jig or special tool is prohibitive in turning out one piece or where the special setting up of a tool is necessary for the right result. But in following through the production of one piece you can see how infinitesimal is the individual cost of that one piece to the whole cost of the thousands of pieces going through with it.

In the organized manufacturing of the Standard shops specialized effort stands strikingly out. Take for instance a steel part which is first cut from the raw stock and drop forged, rough turned, drilled, milled, heat-treated or case-hardened and ground, then filed and balanced and accurately fitted into place. Each one of the varied operations is done by separate hands which are skilled in that particular operation. Many parts go through a greater variation of operations, operations of entirely different character such as machine shop work, forge work, foundry work, pattern work, assembly work, testing work, etc., all calling for the practiced hand and skilled eye of the specialist.

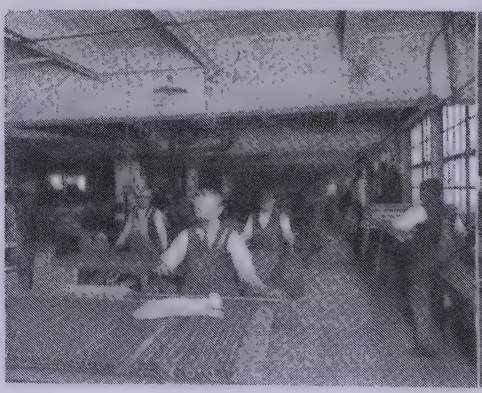
In the Standard plant there is no making of parts on the rule-o'-thumb basis of giving an order to the shop to make so many parts of one kind by the foreman, saying, "Here, Jim, is the drawing—go ahead!" A thorough record is kept in which the brains and intelligence of the foreman and the machinist is recorded by the shop management and division heads. The executive's eyes, ears and hands are really sensitive measuring machines, gauges, scales, etc., through which he feels every pulse beat and every variation of temperature just as the physician knows those things concerning his patient.

Think of the factory equipment necessary to turn out all of these engines in record time. Think of the buildings, the machine tools and the equipment for each one of the several hundred specialists in the organization. The Standard shops cover a city block. The floor space under cover is over 110,000 square feet. Railroad switches run to different points on the property and the whole arrangement is laid out for saving of time and labor from the delivery of the raw material to the shipment of the finished product. Practically every part of the Standard engine is made in the Standard shops which are grouped together about the executive offices.

The machines are laid out so that the heavier castings and forgings do not leave the ground floor but pass from one end of the building down to the far end, several hundred feet distant; the lighter parts in the rough are lifted by elevator to the top floors from which they gradually work down from machine to machine until finally delivered to the erecting shop for assembly together into the engine. Gravity is utilized in many ways in transporting parts and air hoists and traveling cranes are installed throughout the shops so that practically no heavy handling has to be done by the operator. Power is furnished by means of electric converters and individual motors on each shop floor so that machines can be instantly thrown in or out of operation. The most modern tools, regardless of first cost, are installed and the equipment cost per operator is extremely high.

The shops to accomplish what the Standard shops did must have the most modern tools some of which are almost human in their performance, tools which when once set up will turn out stock as long as the raw material is automatically fed to them. The improved technique and finer problems of today demand *standardized* manufacturing for accuracy and interchangeability of production and in the Standard shops the most highly developed grinding tools are prominent, tools which enable the operator to vary the size of the part he is working to one-quarter of one-thousandth of an inch at will or even less if desired no matter whether this piece is of hardened steel or soft steel. This is one of the most striking advantages of modern manufacturing over the old method where the operator's tools were limited to cutting tools such as the lathe, planer, etc.

When the engine is completely assembled it is by no means considered finished. From the assembly room a



Brass Shop. Making Copper and Brass Piping, Tanks, etc.



Drilling Engine Crank Shafts for Oil Ring Holes

car carries it down an incline to the test house. Here the engine is set up under conditions nearly the same as those in the boat. It is coupled to the Standard dynamometer, or water brake, and a full load put on the engine. Then it is started under its own power and run and maneuvered for the regular Standard inspection. Any irregularities in running are noted and all final adjustments are made. The circulating pump is seen to deliver just the right amount of circulating water, the gasolene pump the right amount of fuel, the lubricator just the right amount of oil and the engine is ready for running in the boat. The test house is probably the most important point in the whole line of manufacture, and in the regular testing out of these 1,600 odd engines over $7,000 worth of gasolene and oil alone was used each month.

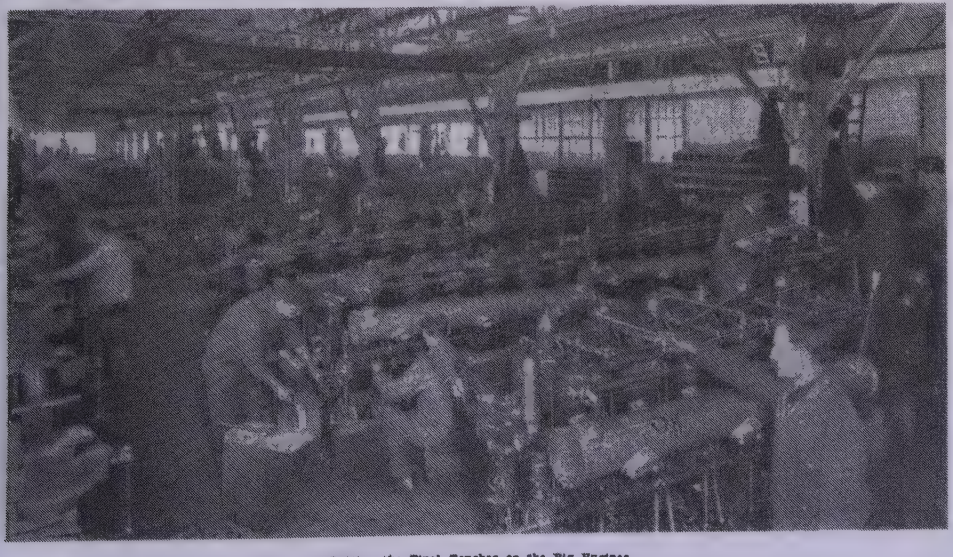
With the final inspection over, the engine is uncoupled by waiting hands and run onto the truck which carries it to where the painter puts on the coats of special paint that protect it as well as dress it and with the paint safely dry the engine goes on to the Shipping Floor where the shipping clerks are hustling to keep up with the uninterrupted procession of engine after engine; directing each to its proper place. With everything safely stowed and fastened down in the car at the loading platform it is speeded on its way for delivery to the boat. Engines were shipped at the rate of a carload a day.

Then comes the highly specialized work of the installing crews who must set up the power equipment in the hull. This work was so laid out that gangs of two or three men went right through from one hull to the other doing just one thing. One gang set up shaft bearings, another gang installed the propeller shafts and propellers, another gang installed the water piping, another gang the air piping, another gang the gasolene piping, and all of the parts which could be installed before the installation of the engine were delivered to the yard ahead of the engines. As soon as the engine arrived the unloading gang hustled it out to the unloading platform and a powerful crane picked it up bodily and placed it on its foundation in the boat. The lining-up gang without a minute's lost time started in lining the engine up with its shaft and fastening it down. With the last fitting in place the boat was delivered to the testing out crew who ran it over the trial course and back again when a flag was raised on the boat to indicate that it was completed and accepted and ready for duty.

The way in which installing of the different parts of the power equipment as each hull reached the stage where the work could be done was a revelation to all, and the men trained to the last minute were always ahead of their work and calling for more, enthusiastic over their work and the part it was playing in the success of the hull.

And remember that it is the engine that makes the boat, or makes possible the right sort of boat. It is this Standard engine which made possible the high speed of the Elco submarine chaser of sturdy construction and seaworthiness, for it is this engine developing its maximum horsepower at less than 500 revolutions per minute which provides for a propeller which gives the high speed to the hull of such fullness of body as to give roominess, comfort and safety to the officers and crew who man these boats.

Just imagine how vital to the success of these boats is the one Standard feature alone of instant control from full speed ahead to dead stop, so that there is not a sound aboard the boat and the noise of turning machinery in the sought-for submarine is heard from out of the darkness; and then with the touch of a finger on a lever the



Putting the Final Touches on the Big Engines

boat is shot full speed ahead or full speed astern so that she can be here, there and everywhere almost at the same time.

Think of the trust placed in these engines which warrants the crews being ordered to sea for ten days at a time cruising constantly under their own power, coping safely with the elements encountered away out of sight of land; and what seems most wonderful to those who have been unfamiliar with the Standard engine is the fact that out of all the hundreds of boats doing this extreme service nothing but highest praise can be said for the absolute infallibility of the machinery.

Unstinted praise for the engines comes from the old hardened sailor and from the raw recruit alike wherever they are doing their bit on these submarine chasers. The men say the conditions met are so severe that if they could not feel absolute confidence in their machinery the life would be unbearable.

The Boats and Their Equipment

THE British boats are 80 feet long, 12 feet 1½ inches breadth over planks, 7 feet 11 inches depth amidships, 4 feet 4 inches draught, 6 feet 7½ inches freeboard forward, and 3 feet 4½ inches freeboard aft.

They are most substantially built because they were designed particularly for use off the British Coast in all weathers and in all seasons of the year. Those who are familiar with the Winter weather conditions on the other side of the Atlantic, particularly in the North Sea and the British Channel, can appreciate what these boats have had to withstand, and as far as can be learned not a single vessel has been lost through any weakness of construction or from the heavy weather it has had to withstand.

The keel, body and deck frames of these boats are of white oak, the fore-and-aft framing of yellow pine, the planking is of yellow pine and the deck of Douglas fir, also known as Oregon pine. Galvanized wrought-iron hull floors and other forgings are used in the hull. Each boat has six transverse watertight steel bulkheads, which divide the hull into seven watertight compartments. The hull is protected by guards, capped with galvanized iron. The stem is protected by a cast bronze cutwater and there are spray-boards at the bow and a breakwater on deck.

Each one of these boats is handled by a crew of ten officers and men. They have stayed out sometimes for ten days or two weeks, so naturally the comfort of those on board had to be considered. All hands had to have warm dry quarters and it was necessary to furnish to them plenty of good warm food, for men cannot fight when wet, cold and hungry. Consequently great care was taken in the interior arrangements of the boats. Beginning at the forward end there is first, a chain locker, the forepeak. Next aft for a space of 19 feet is the crew's quarters. This compartment is fitted with transom berths, has two built-in closets and a toilet room. The storeroom 5 feet fore-and-aft comes next and aft again is a fuel compartment 7 feet long, over which is the charthouse, containing a built-in chart table and a transom seat.

Next is the engine room, 15 feet long, containing the two main engines, auxiliary engine, batteries, air tanks, etc. The officers' quarters are next, occupying a space 20 feet fore-and-aft. These quarters consist of a stateroom fitted with a built-in wardrobe and two berths, a toilet room connecting with the stateroom, a dining room with transom seats and built-in lockers, and a galley with built-in refrigerator and dressers. Aft of the officers' quarters is another fuel compartment 6 feet long.

There are two fuel tanks in the after compartment built of galvanized steel, which will hold 752 gallons of fuel, and two similar tanks in the compartment amidships which will hold 1,316 gallons, so that the total fuel capacity of each boat is 2,068 gallons.

Each boat is driven by two six-cylinder, four-cycle, right and left, air-starting and reversing, 10-inch bore by 11-inch stroke, open-base type, low-tension make-and-break ignition Standard engines developing 220 h.p. each. There is also one auxiliary two-cylinder, four-cycle, 4½-inch bore by 5½-inch stroke Standard engine. Connected with this auxiliary engine is an air compressor, a bilge pump and a generator.

The fire and drainage system is most complete. One engineroom manifold controls the suction from the sea and the bilges to both power and hand pumps. There is a deck pump, four Rose box suctions in the bilge, three bulkhead drains, sea-cocks and piping and special connections to all parts of the boat.

Fresh water is stored in two tanks having a total capacity of 254 gallons, and the plumbing is up-to-date and very complete.

The boats are lighted by electricity, twenty-seven lamps, 25 watt, 80 volt, are placed in different parts and these are supplied with current from a battery with capacity 80 volts, 120 ampere hours at 10-hour rate. There is a searchlight on the charthouse, an electric fan in the engine room, the proper number of switches, etc.

For transmitting orders there is an engine telegraph transmitter for the two engines, electric call bells, and tubes from the bridge to the engine room and stateroom for the voice-pipe system. There are thirteen cowls and ventilators on each boat of special design which can be closed from below and made watertight.

Each boat carries a signal mast 16 feet long, which supports a yard 8 feet long fitted with signal halyard blocks, a 14-foot galvanized iron lifeboat with built-in air tanks and the necessary davits, falls, blocks, etc., a 150-lb anchor, anchor davit, anchor chain 240 feet long, stanchions and three wire rails.

Among the fittings and fixtures are fourteen portlights in the hull, eleven portlights in the after trunk, five portlights in the charthouse, three wooden ladders, three galvanized iron ladders, windscoops, pipe berths, dishrack, bread board, flag locker, mess rack, chart rack, notice board, book shelves, work-bench in engine room, tables in the dining and staterooms and forecastle, tool chests, spare gear chests, captain's chest, fire extinguishers, fog-horn, life jackets, anchor rope, 300 feet long, mooring line, 150 feet long, heaving lines, 90 feet long, boat-hooks, side lights, masthead light, range light, bulkhead oil lamps, weather cloths, searchlight cloth, hatch covers, cowl mouth covers, covers for the engines, cushions for forecastle, charthouse, dining room, berth springs and mattresses.

The Work in Detail

HAVING determined the size, length and speed required of boat, the next thing done was to work out the design, and this fell on the shoulders of Irwin Chase. Mr. Chase never drifts with the tide and when he has work to do he does it with a vim. Hence his success. He had a big job on his hands, because time meant everything, and until he had settled on the model everything else had to wait.

Chase is a graduate of the University of Michigan and he started at once for his alma mater, because there is a model testing tank and a machine which Chase devised for cutting models. All the way out on the train Chase spent his time figuring and when he reached the University he had a very good idea of what he was to do. His calculations all made, the model was cut and tried. Two other models were also made and tried, but the first was the one to show the best results, and having all his data Chase started back to New York, figuring out details all the way. He was home again in one week from the time he had left and had with him a bunch of data which with some would have taken months to obtain.

Then the work began. The designs of the boat were drawn and traced and all the detailed plans were worked out. Having settled on the model the next things studied were the interior arrangements, the power with which to obtain the required speed, 19 knots, and the equipment.

Mr. Sutphen and Eugene Riotte, president of the Standard Motor Construction Company, consulted, and it was decided that the boats should be driven by two Standard engines each of 220 h.p. which, according to Chase's figures, would give the required speed. These are slow-turning engines, air-starting and reversing, and Mr. Riotte at once got busy to plan how two hundred of these could be built, because the original order was for fifty boats. In addition to the two engines for driving, each boat was also to be fitted with an 8-h.p. engine for auxiliary purposes.

In the meantime the plans of the boat were finished and the work of building one began. This first boat was named Victory, after Nelson's historic flagship. The first fifty were all named, but when the next order for five hundred was placed names were dropped and each boat was numbered. This boat was termed the "master boat," because it served as a pattern for all the others and because the quantities of materials used and the amount of labor necessary to finish the boat were carefully tabulated, and on the figures thus obtained it was learned just what would be needed to build all the others and what amount of labor would be required.

Before the other fifty were well underway, however, the order had been increased by five hundred, and the task was multiplied by eleven. The plants in Canada were obtained and elaborate preparations made to collect materials, build parts, assemble all at Bayonne and ship from there to Montreal and to Quebec.

While Mr. Sutphen was attending to the big part of the work and obtaining the plants in Canada, Mr. Chase was preparing sets of plans from which the boats were to be built. Mr. Conrad and his aides were scouting the country to find where purchases could be made of the huge quantities of materials needed and arranging for their shipment to Bayonne, and Mr. Hanson was looking after the general management of the Bayonne works and arranging for the cutting and bending of frames and planking and for making all the other parts of the boats.

In Mr. Chase's department thousands of plans were drawn and traced. There were the usual construction and sectional plans for the hulls, plans for the interiors, plans for the decks, plans for the different sections, for the keels, the body framing, the deck framing, the planking, the engine beds, the bulkheads, the plumbing, the wiring for lighting, the rudder and steering gear, the fire and drainage system, the engine tanks and piping, the interior communication, the call bell system, the voice-pipe system, the ventilation, the deck fittings, the rigging, the rails, the anchor and anchor gear, the lifeboat gear and equipment, and for all the interior joinerwork and arrangement. Not only were plans made to show at a glance each of the different parts of the boat but small detail plans were drawn which showed almost every inch of each boat. In short the boats were drawn on paper, these drawings were traced and blueprints were made by the thousand so that it was possible to find on paper the very smallest detail of any part of the boat, and nothing was left to be figured out when the work of setting up began. A battleship would not have had more drawings. Every piece of wood was shown in these plans and each had the proper holes for rivets, bolts, screws or nails marked and the size of the fastening named. Every piece of metal work was planned out



Indian Cove, Quebec. Storage Basin Filled With Craft Ready for Shipment

in the same way, and with each of these drawings was a specification which told just how it was to be set up and fastened and where. A battleship would not have had more drawings made than did these five hundred and fifty boats and when they were completed it was almost like building boats from paper patterns.

When the master boat was finished, tried and found to be all that was expected, it was the next task to figure out the quantities of the different materials used in its construction and to multiply each by 550 to find out what was required for the fleet.

This in itself was a big task. For the hulls more than 8,000,000 feet of white oak, yellow pine and ash were used. The keels were cut at the lumber mill in West Virginia and shipped to Bayonne in the required sizes, but the planking was cut to size at Bayonne and the frames were bent there. A specially designed beveling machine was devised to cut the planks, and as each piece was cut and shaped and bored for rivets it was numbered to correspond with the number on the plans, and then when a certain number of each part was completed these parts were crated and shipped either to the Montreal or Quebec plants, where the work of setting up began and was soon rushed through.

The details of the hulls being finished then the study of other parts followed, and with each section the care taken was just as thorough as with the hull but on account of the smallness of the quantities was perhaps more intricate.

To enumerate all these details would fill many pages of THE RUDDER, but the mention of a few shows the amount of detail required to just build and equip the hulls.

When Mr. Conrad tried to purchase some of the materials the manufacturers were amazed. Copper burrs were needed in large quantities for the riveting and it was some time before a plant could be found that could furnish these burrs. Finally one concern agreed to sell to the Electric Boat Company the entire output of its factory, and it was arranged that it should ship each evening by express 50 lb of these burrs, 25 lb to Montreal and 25 lb to Quebec, and this it did regularly for several months. Similar trouble was experienced in obtaining copper nails, and one manufacturer put in machinery to cut the nails and for a time devoted all his attention to this work, and every nail went to Canada.

To make these boats still more perfect and in every way suited to the work to which they were to be put, many of the parts and fittings were specially designed and made in large quantities from these designs. The windlass was one of these specials and was fitted with wildcat and gypsy head, chain pipe and cap, brake band, etc., and so compact that it was easily handled and fastened to the deck. The windlass bars were of ash and stowed in wood chocks on the breakwater. The brake bar was galvanized and stowed in galvanized clips on the breakwater. The cowl ventilators (and there were seven of these on each boat) were also of special design and made to close easily and tight from the inside. Two of these were over the engine room, two over the crew's quarters and one over the galley. There were also four mushroom ventilators, and two auxiliary ventilation ducts with swivel cowls over the crew's quarters. The rowlocks, made of galvanized iron, were also of special design as were the sockets.

A special paint had to be made for the interior of the fuel tanks. There is always some water in gasolene and this will in time corrode the tank if it is allowed to remain there. Special drain valves were fitted to the tanks, but in order to prevent the corrosion the inside was painted with what is now known as Elco black. No ordinary paint will withstand gasolene and so this Elco black was made and used, and it is very much like an enamel and absolutely impervious to the gasolene.

The shops at Bayonne were a busy hive of industry and the men were working night and day and "thirty-six hours on Sundays and holidays." When the many parts were cut, bored and finished, they were so well marked that it was a comparatively easy matter for the workmen in the Canadian plants to put these parts together and fasten them. It was just setting up so many knockdown boats, only no 80-foot knockdown boat had ever been devised before. The parts were loaded on the cars at Bayonne, some cars for Montreal and some for Quebec, and there unloaded and the boats built and equipped.

Twelve thousand men were employed to do the work and in Canada very few could speak English. Many were French-Canadians, but there were men of all nationalities except Germans and Austrians, and they did their work well.

The boats were built in groups of forty or fifty at a time. In this work again system and standardization told. First one set of men would set up the keels, and as the pictures show the boats were often built on platforms under which could be run flat cars which would bring up the different parts. The keel men, after doing the work on one hull, would move on to the next and their places would be taken by the framers. These in turn would move on and be succeeded by the men who would put up the fore-and-aft frames, and then would come the plankers. These would be followed by others who would put in the bulkheads and then the deck beams would be laid and the decks follow. It was possible to pass through any one of the big shops and see the boats in all processes of construction from the laying of the keel at one end to the finishing processes at the other. In their proper turns the engine men, the plumbers, the electricians, the joiners and finally the painters and varnishers would work on each boat until it was ready for launching. In some shops the boats were launched stern first, while in one at Quebec the boats were run out on a railway and then on another railway slide down to the water broadside.

When in the water the stanchions for the rails were set up and the three wire rails attached. The deck fittings were attached and the mast and rigging and all deck gear put on board. In the interior other gangs of men were busy with interior fittings and furnishings and the engine men coupled up the engines with the shafting and prepared for the trials. The trials were run, each boat being sent over a certain course, and certain boats selected without any regularity were put through extended trials and then with these all satisfactory the boats were ready for shipment to England and were stored in basins to wait for the ocean steamers on the decks of which they were to be carried.

Figures Tell an Astounding Story

WHEN one speaks of a fleet of 550 boats, each boat 80 feet long, few really comprehend what is meant. Figures mean little to many. Only those who are trained to think and talk figures can at a moment grasp what is meant. So for the purpose of showing what a tremendous undertaking the building of this fleet was an analysis is made to suit the lay mind.

Five hundred and fifty boats, each measuring 80 feet from stem to stern. If these were put in one long line, the stem on one boat touching the stern of that one ahead, the line would be 44,000 feet long, or 8⅓ miles.

Look at it another way. From Halifax to Liverpool is about 2,500 miles. Divide this fleet over this course and it would mean that there would be a boat every 4½ miles of the 2,500 miles. Each boat would be in full sight of the boat ahead and the boat astern. Assuming that the line was traveling at full speed, a boat would pass a given point every 13½ miles, and it would take 5 days, 3 hours, 45 minutes for the entire fleet of five hundred and fifty to pass.

Each boat displaces 32 tons, the total displacement is consequently 17,600 tons.

Each boat can carry 2,068 gallons of gasolene. To fill the tanks of the fleet would require 1,137,400 gallons, and just now gasolene in England sells for 75 cents a gallon, so that the cost of this fuel would be $850,050. Each boat can carry 50 gallons of lubricating oil, or a total of 27,500 gallons for the fleet, at a cost of $41,250.

Each boat consumes 50 gallons of fuel an hour when running at full speed. If each boat was run for ten hours it would consume 500 gallons, and the total consumption for the fleet of 550 boats would be 275,000 gallons, at a cost of $192,000 a day for fuel. One gallon of lubricating oil would be used each hour on each boat, and the total amount used in the ten hours on the fleet would be 5,500 gallons, costing $8,250.

To build the hulls it took 1,960,720 feet of white oak. 2,225,830 feet of yellow pine for planking, and 3,849,500 feet of Douglas fir, ash, pine, etc., for joinerwork, etc. Of the latter 400,000 feet were used for ceiling and 400,000 feet for flooring.

Each boat carries a galvanized iron anchor, weighing 150 lb. The total weight of the 550 anchors was 82,500 lb. To each anchor was attached a ⅜-inch galvanized iron chain, 240 feet long. If the 550 chains were in one length they would reach 132,000 feet, or 25 miles.

The mast carried on each boat is 16 feet long by 4 inches in diameter. If all the masts were in one it would be a spar 8,800 feet long, which would tower 1½ miles up in the air.

Paint was another important item. The boats were painted battleship grey outside and another grey inside. Each boat had 22 gallons of inside grey paint, 22 gallons of outside grey paint, 20 gallons of flat white paint, 7 gallons of white enamel paint, 7 gallons of inside varnish and 8 gallons of bottom paint. In all 86 gallons of paint were used on each boat or 47,475 gallons for the entire fleet. It also took 83,035 lb of putty, 102,700 lb of white lead, 27,264 lb of caulking cotton and 34,000 lb of marine glue to make all the hulls tight.

The bulk of this large order for paint went to the C. A. Woolsey Paint & Color Co. and The Debevoise Company, both of whom specialize in marine paints and varnishes and have world-wide reputations.

The propellers were made by the Columbian Bronze Corporation. In all 1,400 propellers similar to the architect's design, 42-inch diameter, 63-inch pitch, were made. Each weighed 125 pounds and two were fitted on each boat. To make these wheels 175,000 pounds of manganese bronze were used. This bronze is up to United States Government standards, which require 65,000 pounds tensile strength. The plant of the Columbia Company at Freeport was kept very busy and the wheels were shipped at the rate of twenty every two days, each shipment weighing 2,500 pounds. During the experimental time before the large order was placed several pairs of experimental wheels were furnished to the Elco Company. Once Mr.



Ready for a Trial. The Chaser in Her War Paint Waiting to Be Sent on a Speed Test

Chase telephoned about 10:30 on a Thursday morning saying that he had to have a special pair of wide blade propellers at the Elco plant by Saturday night. This meant making two special patterns different from others and then casting and machining them. They were delivered at 7 o'clock Saturday evening making one of the many records established in the big work.

Each boat was equipped with four Johns-Manville fire extinguishers of the one-quart hand-pump type. The engineers in charge of the design and construction of these speedy craft specified Johns-Manville extinguishers only after making exhaustive tests and a thorough examination of materials and construction. Each extinguisher was furnished in fire box red. Two were placed in the engine room, one each in the pilothouse and officers' quarters. There were 2,200 in all.

Cushions and mattresses were made by M. W. Fogg. In all there were 6,050 and spread over the ground they would have covered several acres.

All the deck fittings and hardware were furnished by C. D. Durkee & Co., of New York. These included the telegraphs to the engine room, the thousands of ports, ventilators, steering gear, etc., and were all up to Durkee quality.

The pumps were made by the Goulds Manufacturing Company at Seneca Falls and W. H. Goblet furnished the bronze ball valve plumbing in the original order.

The summary of the quantities of materials used is astounding, and some of the big items have been mentioned in the following summary:

LUMBER

Oak, (Keels, Frames, etc.)	feet, B.M.	1,960,720
Yellow Pine, (Planking, etc.)	feet, B.M.	2,225,830
Ash, Pine, etc., (Joiner Work)	feet, B.M.	3,849,500
Total Lumber used, feet B.M.		8,036,050

(Board Measure.: Each board 12" wide, 1" thick)

METALS, PIPING, ETC.

Galv. Iron Forgings	pounds	1,272,875
Bronze Castings	pounds	560,200
Steel Bulkheads	pounds	578,600
Lead Pipe	pounds	28,500
Galv. Pipe	feet	56,450
Brass Pipe	feet	109,450
Copper Tubing	feet	14,850
Sea Cocks		4,950
Valves		10,450
Rail Fittings		66,000

ELECTRICAL FITTINGS

Conduit	feet	100,650
Wire	feet	535,150
Electric Lamps		25,850
Searchlights		550
Storage Batteries		22,000

BOAT EQUIPMENT

Fresh Water Tanks (1100)	capacity, gallons	110,000
Gasolene Tanks (2200)	capacity, gallons	1,137,400
Linoleum	yards	11,550
Canvas	yards	32,300
Manila Rope, etc.	feet	611,050
Bronze Wire Rope	feet	15,000
Galv. Wire Rope	feet	310,000
Ventilators		11,550
Deck Pumps		550
Portlights		16,500
Refrigerators		550
Iron Ladders		1,650
Sinks and Wash Basins		1,650
Toilets		1,100
Engine Telegraphs		550
Pipe Berths		2,200
Name Plates		7,150
Life Preservers		6,600
Brass Deck Plates		4,950
Gasolene Stoves		550
Life Boats		550
Sailing Lights		2,200
Oil Lamps		3,850
Canvas Covers		13,200
Cushions and Mattresses		6,050
Fire Extinguishers		2,200

PAINT, VARNISH, ETC.

White Lead	pounds	102,700
Putty	pounds	83,035
Marine Glue	pounds	34,000
Caulking Cotton	pounds	27,634
Paints and Varnish	gallons	47,475

FASTENINGS, ETC.

Brass Escutcheon Pins	pounds	1,527
Galv. Iron Rod	pounds	24,200
Galv. Nails	pounds	104,190
Copper Nails and Burrs	pounds	250,996
Galv. Washers and Clinch Rings	pounds	401,401
Galv. Screws	gross	12,266
Brass Screws	gross	23,606
Iron Bolts and Nuts		979,504
Wood Plugs		3,705,429
Brass Bolts and Nuts		24,944

FREIGHT IN CARS AND TONNAGE

Arrived in Bayonne	797 cars, pounds	27,434,200
Shipped to Canada	1144 cars, pounds	40,632,000
Total	1941 cars, pounds	68,066,200

Praise for the Boats

IT was only natural that the 80-foot patrol boats built by an American corporation should have been severely criticized in England. The builders there resented the placing so large an order away from home just as American builders would criticize the Government placing an order abroad at this time. When the boats began to arrive in England the experts declared they were too light for the service to which they were to be put. Fault was found with almost everything, from the models, construction, engines and equipment. Unfortunately the British builder was not alone in this fault-finding but a little coterie of Americans promptly through jealousy, also criticized. For a time the British could not handle the boats or engines properly and those in charge could not get the required speed. Things were serious and Irwin Chase was sent over to smooth out the troubles and he was just as successful at this as he was in designing the boat. He first consulted with the Admiralty officials and soon became a prime favorite with the big men in the British Navy. He obtained permission to try

the boats over the measured mile, and much to the surprise of the knockers the boat, although only two days off the ship that transported it across the Atlantic, exceeded the speed called for.

Chase then had a school of instruction and showed how to handle the engines and the boats. Later, in order to demonstrate the seaworthiness of the boats, he obtained permission to take one out of harbor in such heavy weather that the destroyers had been ordered in, and the boat behaved beautifully, silencing at once all unfair criticisms.

From that time the boats began to grow in popularity and now those who have handled them are loud in their praise.

It would be hard to find a piece of water which can furnish worse weather than the North Sea, and it is on the North Sea that a majority of these 80-footers are used. Many of them are handled by yachtsmen. One yachtsman who has charge of one, No. 345, who is a member of the Humber Yawl Club, recently wrote:

> You know how much I dislike a power boat or anything to do with an engine. For several months I have had charge of ML-345 and have been stationed in the North Sea. It has been hell outside. What I dread most are the long nights, but thank goodness, these are getting shorter. I am really learning to like the boat and she has proved herself to be a wonder in all kinds of weather. What I like about her is her weatherly qualities. She can stand anything in the way of storm or weather. The only fault I find is that sometimes in a heavy sea a slight leak will start in the cabin trunk and that always seems to be over my bunk. The engines too have done wonders, and have never failed.

Dr. G. R. Radmore, a surgeon of Germantown, Pa., has also written in praise of these boats. He writes:

> Since arriving in this country, I have noticed correspondence reflecting on the qualities of the "submarine chasers" built in the United States for England, and known by the marks "ML-350," or whatever may be the number, of that particular boat. I believe five hundred and fifty were supplied.
>
> Last Summer I was on the staff of a war hospital, at a certain coast town in England. To this port ML launches were frequent visitors, coming in for supplies, to report, etc. On several occasions, professional duties brought me into contact with officers and crews, and I had excellent opportunities to observe the craft in question. Without exception those in charge of them were more than satisfied with them. They were capable of developing a terrific speed from the start, and as easy to handle "as a motor car," as one officer put it. They were excellent sea-boats, and, armed as they were with a powerful gun, have been one of the best assets we have, in accounting for U-boats.
>
> To this particular port two enemy submarines came in August last, making war on the defenseless fishermen. They had a very brief run for their money, for the ML's attached to this particular station accounted for both of them inside of thirty-six hours!
>
> I believe these launches were about 80 feet long, and, considering the rough waters of the English Channel and its approaches, no doubt boats 30 or 40 feet longer would be an improvement; but that the five hundred and fifty built here and sent over have done splendid service is certain.

Charles Allison, a member of the Royal Norfolk and Suffolk Y. C., who is now in this country on official business of the British Government, called at THE RUDDER office a few days ago and talking about the 80-footers said they are fine boats and have done remarkable work. Mr. Allison said the storms this Winter have been very severe but the boats have held their stations all the time and done all asked of them. Mr. Allison speaks from personal experience because he has been on board some. He hopes when the war is ended to be able to buy one cheaply and use it as a yacht.



At Montreal Awaiting Transport. Duke of Connaught Dock on Which Many Were Built Shown at Right

The Men Who Did the Work

HENRY R. SUTPHEN was the engineer of the big enterprise so successfully worked out. He first obtained the order to build the 550 boats and then by his ability and efficiency was able to systematize things so that the organization ran on as smoothly as one of Eugene Riotte's big Standard engines. Mr. Sutphen is first an engineer but unlike many engineers he has a big mind for business and coupled with these he also has tact. His tact has enabled him many times to smooth over difficulties that have seemed serious and in his many business undertakings he has often brought together opposing interests so that they formed one harmonious whole. He is still a young man and rising fast in the manufacturing and business world. He has the faculty of grasping things quickly, making up his mind promptly and then having done so he works things out to a successful end.

In his account of the building of these boats Mr. Sutphen has praised those who worked with him and given credit where credit is due. Without much help he could not have carried out this work successfully. He appreciates that more than anyone else and like a good general gives praise where praise is due.



Henry B. Sutphen

Henry R. Sutphen was born at Morristown, N. J., May 13, 1875. When eighteen years old he entered the employ of the Electric Launch Co. of New York, now the Elco Co. of Bayonne, N. J., and since then has been continuously associated with that company and its successors. He occupied successively the various positions of Electrical Engineer, General Manager, and Vice-President. Mr. Sutphen is the inventor of devices and appliances in connection with electrical and gasolene-propelled boats. Through his efforts his company was the first to standardize small boat building, which experience proved of enormous value in carrying out the building of the 550 Elco submarine chasers for the British Admiralty, which type of boat was originated by Mr. Sutphen and first built by his company.

He has been very active as First Vice-President in the National Association of Engine and Boat Manufacturers, acting as chairman of the Show Committee for the past thirteen years. He is a member of the Society of Naval Architects and Marine Engineers, chairman of the Marine Standards Committee of the Society of Automobile Engineers, a member of the New York Chamber of Commerce, of the New York Y. C., of the Seawanhaka-Corinthian Y. C., and the Automobile Club of America.

Thomas S. Hanson, the General Manager of the Elco Company, has been with that concern since 1895—twenty-two years—and yet with all that experience he does not look much older than when he first helped to sell electric launches. He is an indefatigable worker, understands the business from the foundation and worked so ardently on the big job that he took a room at Bayonne in order not to waste time commuting to and from New York. In spite of the pressure on all employed in the Bayonne Works Mr. Hanson has managed this year to sell about ten fair sized yachts, so that the Elco Company is still a yacht-building concern.

Irwin Chase, the designer and naval architect, graduated from the University of Michigan in 1905 and joined the Elco forces the next year. For eleven years he has been a prominent figure in the power-boating world and he has turned out some of the fastest boats that have won races as well as many good cruising craft. Everybody knows Chase and everybody likes him. He is not only a designer but he can handle a boat most skilfully and has a nerve that will carry him through any difficulties. He is as modest as he is able and his hobnobbing with the Right Hon. Arthur J. Balfour and other British dignitaries has not turned his head a fraction.

Another University of Michigan man who did great work is Ernest B. Conrad, the superintendent and purchasing agent. It was a man's job to know where to procure the millions of dollars' worth of materials necessary for the building of the boats. Mr. Conrad was born in California. He was educated in Michigan, graduating from the University in 1890. After some practical experience in 1892 he was head of the catalog department of the General Electric Co. In 1896 he was in charge of the construction department of the Sprague Electric Co. and in 1899 joined the Elco Company as superintendent and purchasing agent.

Eugene A. Riotte, who is president of the Standard

Motor Construction Company, was born in Oakland, Cal., in 1879. His brother, the late C. C. Riotte, began to build gasolene engines in this city in 1895, and in 1898 the two brothers formed a partnership in the Empire Motor Company. The next year they formed the Standard Motor Manufacturing Company with a plant in Harlem and in 1900 the United States Long Distance Automobile Co. in Jersey City. These two companies were merged in the Fall of 1900 under the name of the Standard Motor Construction Company. C. C. Riotte was the originator of the reversing type of gasolene engine. It is this that makes the Standard engine so well adapted for marine work and particularly for the patrol boats in which it has been used. The two brothers worked together in the development of the engine until C. C. Riotte died in 1908 and since that time Eugene A. Riotte has managed the company and with his ability and efficiency has made it take a leading place among the manufactories of this country.



Irwin Chase, Designer



Thomas S. Hanson, Manager



Ernest B. Conrad, Purchasing Agent

Song of the Sea Slugs

M. L.

Sing me a song of a frail M. L.
May the Lord have mercy upon us;
Rolling about in an oily swell,
May the Lord have mercy upon us;
Out on a high explosive spree,
Petrol, Lydite, and T. N. T.,
Looking for U-Boat 3. 3. 3.
May the Lord have mercy upon us.

Sing me a song of a Bold Young "Lieut."
May the Lord have mercy upon us;
Two gold bands on an "Owed for suit,"
May the Lord have mercy upon us;
Ship the cable and full ahead,
Hard a starboard and heave the lead,
The detonators are in my bed,
May the Lord have mercy upon us.

Sing me a song of a bright young "Sub."
May the Lord have mercy upon us.
A very ignorant half-baked cub.
May the Lord have mercy upon us;
Of the King's Regulations he knows not one.
He has left undone what he ought to have done,
And Oh! My Lord, when he fires that Gun
May the Lord have mercy upon us.

Sing me a song of a CMB (Engineer)
May the Lord have mercy upon us;
Bred in a Garage and sent to sea,
May the Lord have mercy upon us;
Taken away from the Motor trade,
Seasick, sorry and sore dismayed,
But a Hell of a "Knut" on the Grand Parade.
May the Lord have mercy upon us.

Sing me a song of the M. L. Cook,
May the Lord have mercy upon us;
With a Petrol stove in a greasy nook,
May the Lord have mercy upon us;
Our meals, a lukewarm lingering death,
We'll praise the Hun with our final breath
If He'll strafe our Galley and slay our Chef,
May the Lord have mercy upon us.

Sing me a song of a North Sea Base,
May the Lord have mercy upon us;
A dirty forgotten one horse place,
May the Lord have mercy upon us;
When the wind blows West, how brave we are!
When the wind blows East, it's different far,
We wish we were back in the Harbor Bar.
May the Lord have mercy upon us.

Sing me a song of the U. S. A.
May the Lord have mercy upon us;
Now, where ELCO builds five boats a day
May the Lord have mercy upon us;
M. L. five-fifty is now offshore,
The U-Boat Skippers want no more,
We'll make them tired of this damned war,
May the Lord have mercy upon us.

Aramis, a Handsome Yacht

ARAMIS, the 157-foot power yacht owned by Arthur H. Marks, now serving in the Navy Department as a constructor, is the largest and most up-to-date power yacht built and with its most attractive furnishing, decoration and equipment is one of the handsomest yachts owned in this country. Her accommodations for a vessel of her size, 157 feet long, are remarkable and are better than can be found in a steam vessel of much greater length.

Mr. Marks is vice-president of the Goodrich Rubber Company. He has a Summer home at Marblehead and is a member of the New York and Eastern yacht clubs. He had intended making a cruise in the late Winter in the Aramis, which was launched last December, but, delays in finishing the yacht prevented this, and now Mr. Marks is working to help get out the fleet of patrol boats for coast defense. It is possible that his yacht Aramis may be enrolled in that fleet, but it will be a great pity if the interior decorations and fittings, which have been put in at great expense, are destroyed, as they have been on many of the yachts now fitted out for war purposes.

Aramis was built by Robert Jacob at City Island from designs by Swasey, Raymond & Page and in model she somewhat resembles the Paragon, which, until now, Mr. Swasey had regarded as his best work. The Aramis is bigger and more powerful in every way. She is a steel vessel and has two steel deckhouses. The interior finish of the after deckhouse is in teak and that of the forward deckhouse, in which is the dining room, is in silver oak, and all the furnishings of that room are in keeping with the joinerwork. The rails and other deck trim are teak.

The general dimensions of the Aramis are, length 157 feet, breadth 23 feet, draught 7 feet 6 inches, displacement 225 tons. She is driven by two Craig-Diesel engines of 350 h.p. each. These engines, turning 300 r.p.m., will give the yacht a speed of about 13 miles an hour.



Social Hall and Music Room of Aramis. The Furnishings Are Rich and Artistic. Note the Open Fireplace at the After End



Bridge Deck Mounting Two Rapid Fire Guns



Dining Room, Finished in Silver Oak

The yacht has one smokestack, one signal mast just forward of the stack and a small mast further aft to help support the wireless plant. The bridge is at the after end of the forward deckhouse, on the top of which are mounted two rapid fire guns, searchlight, binnacle, etc. The engine space separates the two deckhouses and the quarter deck is large enough for the owner to use for a dance. This is comfortably furnished with wicker chairs and is most inviting.

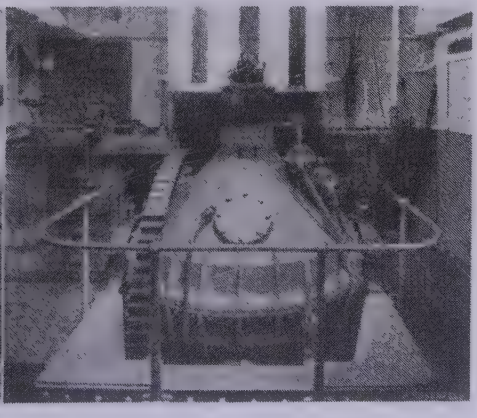
The dining room is one of the show rooms of the yacht. The decorations are simple and rich. All the furnishings are in keeping with the silver oak, the finish of the joinerwork. Ports at the forward end and plate-glass windows at the side give plenty of light and ventilation. In the after house is the social hall and music room which is finished in teak. At the after end is an open fireplace. Big comfortable chairs and settees are pulled near to this end while at the forward end is a companion leading below and a large choralcelo. Tables, a desk, a graphaphone, lamps and settees furnish this room. Below decks the rooms are just as commodious and as handsomely furnished as those on deck, as the pictures taken by Mr. Rosenfeld show. The owner's and guests' quarters are finished in white with mahogany trim.

The equipment of the yacht includes everything that can contribute to the comfort, pleasure and safety of those on board. It is lighted by electricity and has heating and refrigerating plants. The yacht carries a crew of nine men.

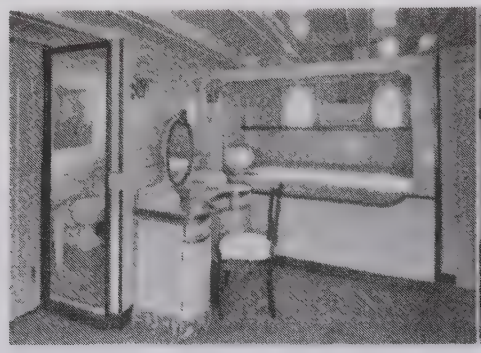
The Craig-Diesel engines will use about 40 gallons of heavy fuel oil an hour when the yacht is underway and with fuel oil costing only a few cents a gallon the cost



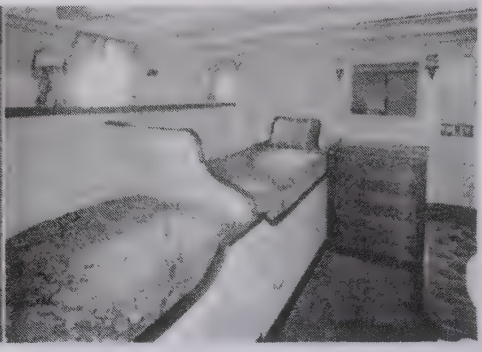
Two Craig-Diesel Engines Drive the Aramis



A Sperry Stabilizer Keeps the Yacht on Even Keel



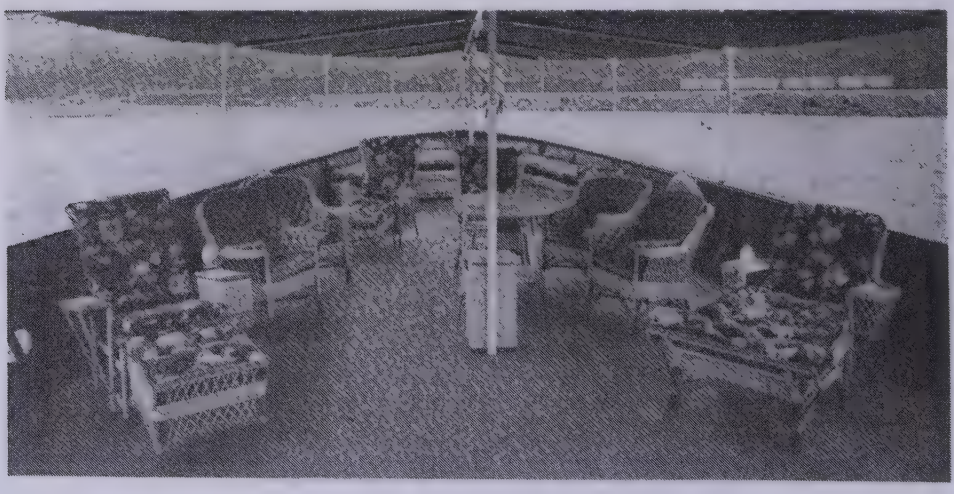
A Daintily Furnished Stateroom



Another Room With Transom Berths

of running the yacht will be very low. The fuel tanks have a capacity of 6,000 gallons and this will give the yacht a wide cruising radius.

The Aramis is equipped with a Sperry stabilizer which has been specially designed and built for this yacht, and on the trials so far has worked very successfully. Several yachtsmen have had stabilizers placed in their vessels to keep them as nearly as possible on an even keel, and with the rolling reduced to a minimum the pleasures of yachting for many are materially increased. A stabilizer will keep a vessel on an even keel and at times it has been used to make the vessel roll and thus work off a sand bank on which it may have run. Rumors were rife recently that this stabilizer had caused the Aramis to roll to such an extent that she was in danger of capsizing. Robert B. Lea, of the Sperry Gyroscope Company, the builders of the stabilizer, has been trying to trace the origin of these rumors but so far has failed. He says that the outfit on the Aramis is one of the best equipments turned out and the results obtained from the trials have been very gratifying. The curves taken on the trials show that the greatest roll without the stabilizer was 26 degrees at 1,900 r.p.m., and this when the stabilizer was used was quenched to less than 3 degrees, which is hardly perceptible. Mr. Lea says that while it is possible by simply turning a small switch to roll a vessel with the stabilizer, this could be done only to an amplitude of about 10 degrees, which would in no way endanger the yacht or tend to upset it.



Spacious Quarter Deck of Power Yacht Aramis

Patrol Boats of Russia and Italy

Britain is not the only country to have patrol boats or submarine chasers built in this country. Uncle Sam is now busy gathering a fleet. Some of these are patrol boats that have been built for yachtsmen and which are now enrolled in the Coast Defense. This fleet will be augmented soon by the 110-footers building in Navy Yards and by private builders. Russia and Italy have had boats built here which have done well. Some of these boats are shown herewith but vessels for war uses are not driving all other types out of the builders' yards. Pleasure craft are being built, some of which may be adapted very easily for patrol work, and day boats, runabouts, cruisers and vessels for commerce are also occupying the attention of designers and builders.

Russian Patrol Boats

One of the 60-foot patrol boats built for Russia by the Greenport Basin & Construction Company was officially tried on Gardiners Bay last month under the supervision of Government officials. This boat is one of a fleet and the guaranteed speed is 29.5 knots. Forty-two boats of this model have been built. With the earlier ones the speed guaranteed was 26 miles an hour, but the power has been increased to give a higher speed. The boats are now equipped with two eight-cylinder, 6¾ by 7¾-inch Duesenberg engines.

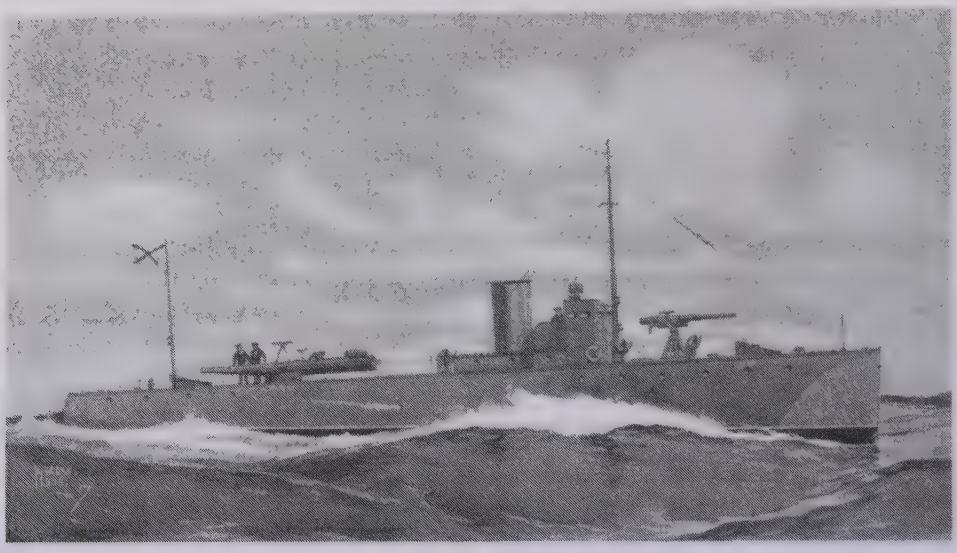
These boats, which are designed by J. W. Hussey, are of the V-bottom type with the floor flattening out aft, so that they are in reality a huge monoplane. The principal dimensions are: 60 feet long, 10 feet breadth and 3 feet draught. The two big Duesenbergs are installed practically amidships with ample room for the mechanics. The speed of 29½ knots guaranteed by these boats has been exceeded in each instance. Each boat must be able to cruise at top speed for 300 miles with one filling of the tanks. Fuel is carried in four 270-gallon tanks placed just abaft of the engine room, giving a total capacity of 1,080 gallons, which at the guaranteed speed, gives a cruising radius of approximately 500 miles, while at a lower speed 1,000 miles can be covered on one filling.

The boats, painted a battleship grey, are very businesslike looking propositions, low, rakish and fast as a streak. Flush decked, with a small steering shelter just forward of amidships as protection for the helmsman and a small house skylight over engine room and the after stateroom. The hulls are subdivided by four watertight steel bulkheads, two shutting off the engine room from the rest of the boat and an additional steel bulkhead aft going only halfway to the deck. Forward there is a good-sized cabin, affording accommodations for six men, an oilstove, toilet and lavatory. Aft is a smaller stateroom with the accommodations for the two officers, also the wireless table, chart table, chest of drawers, and an enclosed toilet room. Each boat is equipped with a powerful wireless set manufactured by Cutting & Washington, a very compact and efficient installation that has proven out well in service.

Eight new boats recently ordered by the Russian Government are to be 72 feet long, 11 feet 3 inches



Russian 60-Foot Patrol Boat Making 29.5 Knots. Built by the Greenport Basin & Construction Company, and Equipped with Two 8-Cyl. Duesenberg Engines



New Russian 72-Foot Patrol Boat, to Be Built by the Greenport Basin & Construction Company, to Make 28 Knots With Three Duesenberg Engines

breadth and 3 feet 3 inches draught. Each boat is to be driven by three eight-cylinder, 6¾ by 7¾-inch Duesenberg 350-400-h.p. engines. Each carries an 18-inch torpedo tube amidships and a 47-mm. rapid fire gun on the forward deck. The boats are controlled from the bridge deck with a sheltered cabin for the quartermaster, with controls from either the shelter or bridge deck. A speed of 28 knots is guaranteed.

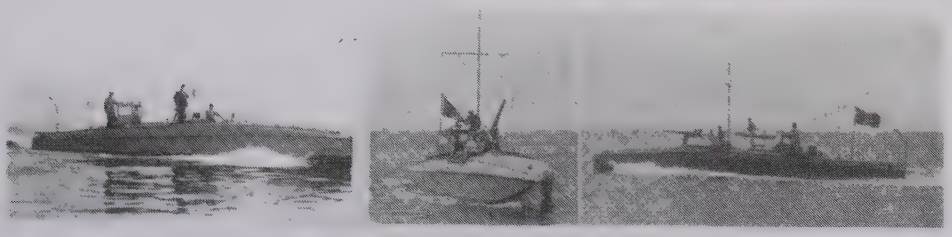
Ample space has been provided for the crew and officers. The forepeak is arranged for chain lockers and bosun's gear lockers, followed by ship's galley, which has two pipe berths. Next to the galley is the officers' cabin and wireless room, which is entered by a hatch from the steering shelter. Next aft is the machinery space for the three Duesenberg engines, a 3-k.w. Universal lighting set, the necessary oil tanks, batteries and a work-bench. The next compartment contains fuel tanks with 1,300 gallons capacity. Aft of this compartment is located the crew's quarters, berthing eight men. The hull is divided into six watertight compartments by steel bulkheads.

Italian Patrol Boats

The Italian Government has for some time been building patrol boats which are unlike any other boats used to chase submarines. These boats are 58 feet long. 9 feet breadth, and are equipped with two 6.5-mm. Colt automatic rifles and one 4.7-mm. anti-aerial gun. Unlike the American or British types, the Italians have a bow curved similar to the fast racing craft of recent years. These boats are driven by Sterling engines, which have been shipped to Italy from the factory here. Recently at a dinner of the Sterling Bowling Club, Captain Good, late of the British Army, who is now consulting engineer for the Sterling-Sunbeam Airplane engine, and Mr. Flaherty, of the company's engineering force, told some interesting facts about the war engines and patrol boats. Captain Good, introduced by President Criqui, said:

There isn't much I can say to you fellows of personal importance, but I thought perhaps the actions and experiences of the little submarine destroyers, some powered with Sterling engines, in European service might interest you.

There are thousands of these little boats daily combing the North Sea for submarines. Overhead a dirigible of the blimp type soars, steadily zigzagging along a prescribed territory. Suddenly "Fritz" is sighted—quickly the wireless operator in the blimp flashes a message to the pair of chasers—directing their operations towards the submarine. "Fritz" is a wary craft, and with his boat adorned in alternate shades of blue and violet, covered with the mosses and barnacles of the sea, he is a hard proposition to discern. The little chasers, gathering speed, proceed along the course taken by the submarine and, when in his immediate vicinity, drop between them a copper wire net. Dragging this along back of them, they rapidly overtake the submarine and the blades of the propeller, catching in the mesh of the copper net, quickly bring Fritz to a standstill. Immediately the captain of the U boat starts to rise. As soon as his periscope clears the surface of the water a steady stream of lightning rapidity emanates from the rapid firing guns of the chaser and the eye of the periscope disappears. Blinded, Fritz still continues to rise, and as the front deck of the submarine comes out of the water, a hatch crashes open, and a 4.5 comes into view. It then becomes a question of which is the quicker shot. If the little chaser gets in the first wallop with her 3-pounder, the submarine is finished, but once they train their 4.5's on the destroyer, they smash these boats up like match boxes. Sometimes Fritz's compressors are not working properly and there is insufficient air to force the water from the compartments; in that case he has to lie below the surface of the water until a trawler comes along, which raises him and makes crew and boat captives, providing the crew is still alive. Sometimes they are under water for three days, held there by the destroyers to avoid a surface battle, at the expiration of which the trawler raises them, dumps out the crew and tows the submarine into port.



Italian Chasers Equipped With Sterling Engines of 400 H.P. Make 26 Knots. They Mount a 47-mm. Anti-aerial Gun and Rapid Fire Guns

In one harbor during 1916, eighty-six captive submarines were observed, heavily guarded, and although it would seem that at the rate of destruction and capture of these craft, the German Navy would rapidly become depleted of its U boats, it has lately been reported that the Germans are able to construct new submarines at a faster rate than they are destroyed.

Mr. Flaherty told about the Italian boats and how he taught Italians to operate the Sterling engine. His method was to have one engine sawn in half longitudinally and every working part was thus easily explained to the students. Mr. Flaherty also in his remarks told of bombs used to destroy submarines and said in part:

There are many processes of destruction peculiar to each government, a number of which have been kept secret; the Italian Navy, for instance, has had a secret for fifteen years' standing, involving a torpedo which is towed from the stern of one of these boats and which will submerge at a rate proportionate to the speed of the boat, with the intent of its hitting the submarine.

The average depth to which a submarine submerges is probably not over 150 feet, although the record is 320 feet. U boats of the type being rapidly constructed by the German Government, are approximately 275 to 300 feet in length, and although immensely practical, it is within the province of the destroyer to exterminate them.

There is a type of bomb greatly resembling a pail about 16 inches in diameter, 18 inches high, containing about 100 lb of high explosives—T.N.T.—or ballinite. These bombs, sinking until the pressure at a certain depth causes a contact, explode with such a concussion as to render ineffective the chemicals of the submarine's batteries in a radius of 150 yards. Now if the submarine has her batteries destroyed, her electric engines cannot run, and she is compelled to expel the water from her compartments by air pressure and rise by virtual buoyancy to the surface in order to use her Diesel engines. There she is an easy target for the anti-aerial gun which, by the way, has an effective range of 7 miles.

These boats are capable, by reason of their shallow draught, of traveling completely over a mine field, which is planted below the surface. With a certain appliance they reach down and cut the mine ropes, and as the mine floats to the surface, it is either taken in tow and planted at a point disadvantageous to the enemy, or is destroyed. It is said that some of these boats are also equipped with 18-inch torpedo tubes and 57-mm. anti-aerial guns. It is reported that a boat of this type captured one Danish and one Spanish steamer, which it is known had been supplying submarines with oil in the Mediterranean.

One method of destruction in connection with the aeroplane or balloon service, is for the destroyers to rush in a bunch to the spot the submarine was last seen to sink; spreading out star-shaped, they continue to run and when the submarine comes to the surface, she must be between two of them, where, guided by the aeroplane or balloon, it is a simple matter for the chaser to run them down. Right here is where high-speed Sterling engines do their duty; traveling twice as fast as the submarine they rapidly overtake it and the bomb or torpedo comes into play. Frequently oil is sprayed on the water with the object of its accumulation in the eye of the periscope, so blinding the submarine.

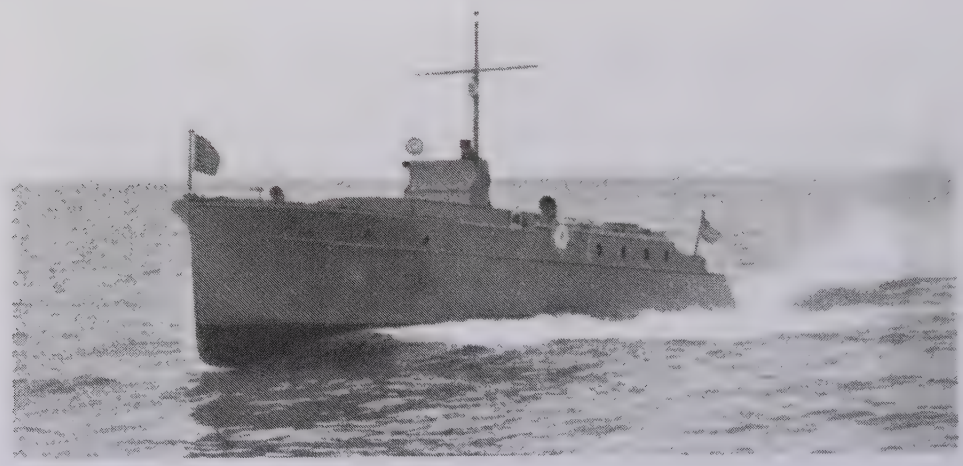
Donald Ryerson's Sea Tag

Sea Tag is the name of a new 50-foot patrol cruiser which has recently been launched and tested at the works of the Great Lakes Boat Building Corporation. She is well named, as she has been enrolled in the Naval Reserve Squadron and may play tag with some submarine. Sea Tag is the property of Donald Ryerson, vice-president of Joseph T. Ryerson & Son, of Chicago. The yacht embodies all the 1917 improvements and has been designed for structural strength, stability, seaworthiness and speed.

The one feature of unusual interest is the arrangement provided for the mounting of the gun. In the Sea Tag a depressed cockpit has been built in forward very heavily reinforced to the frames and carried to the keel with pipe stanchions. This method of construction reflects the recommendations made by the various officers of the Government who have given careful study to the problem. The present plans contemplate the mounting of a one-pounder forward, and a machine gun aft in sub-



Italian Submarine Chasers in Basin Having Guns Mounted



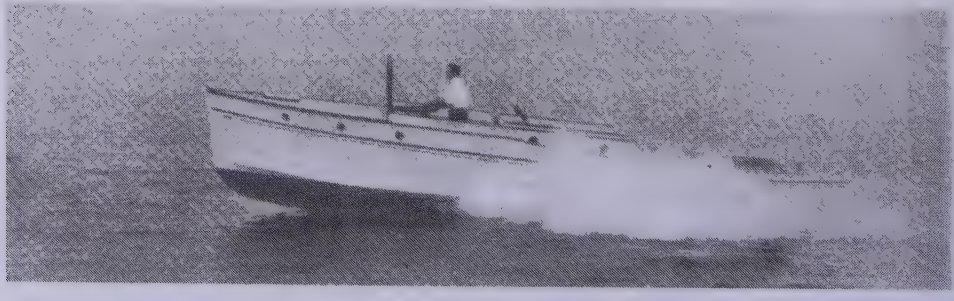
Sea Tag, Donald Byerson, Owner; Built by Great Lakes Boat Corporation for Patrol Duty. Length 50 Ft.; 8-Cyl. Van Blerck Engine; Speed 26 M.P.H.

merged cockpit which has reinforced floors for the purpose in question.

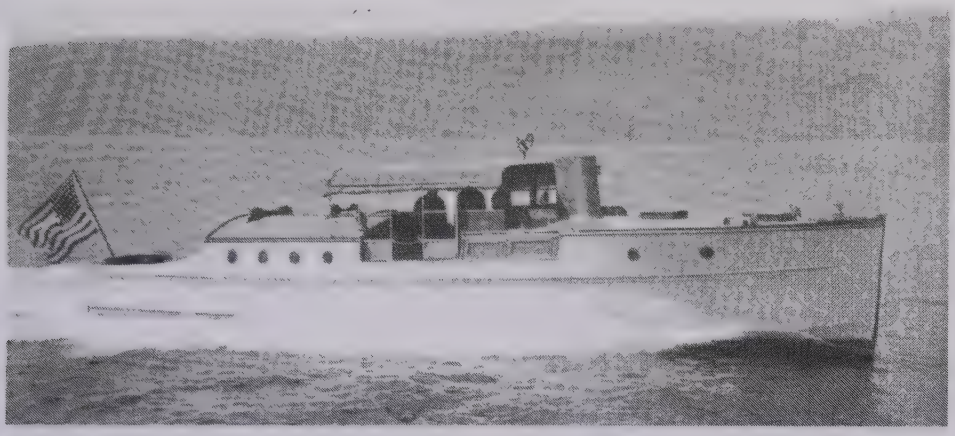
The cruiser is 50 feet over all with 10 feet breadth, and powered with an eight-cylinder 6 by 6-inch Van Blerck engine, which drives her 26 miles an hour. The boat is very heavily constructed and has accommodations for two officers and a crew of six, so this speed is exceptional. The crew's quarters are forward, divided in two compartments, with sleeping accommodations for six, followed by a bridge deck and engine compartment, aft of which is a completely equipped galley. Adjacent to the galley is the main cabin with sleeping quarters for two officers, followed by a submerged self-bailing cockpit. Full headroom is provided in the engine compartment even though all controls are carried to the bridge deck for one-man operation. The crew's quarters, in the forward part of the hull, are provided with two transom and two pipe berths, and additional quarters aft of the gun cockpit are arranged with two built-in berths. Entrance to the crew's quarters is to be had either through a hatch in the raised deck forward, or through a hatch provided in the submerged cockpit.

Express Cruiser Gitana

Gitana, a 50-foot military type express cruiser built by the Great Lakes Boat Corporation, has recently been delivered to Philip de Ronde for whom she was built. Mr. de Ronde is president of the Oriental Navigation Company, owners of the steamship Aztec, which was recently sunk by a German submarine, and he has enrolled Gitana in the Coast Defense Service. The Gitana while on a trial trip delivered the sailing orders to the captain of the Aztec. She was launched at Milwaukee on March 8th and shipped to New York as soon as completed for trial. The yacht is 50 feet long and is one of the standardized stock types. The power is an eight-cylinder, 6 by 6-inch Van Blerck engine of 200 h.p., which is installed under the bridge, and this will drive the yacht 22 to 24 miles an hour.



Manatee, L. P. Percival, Owner. Now in Government Service; 35 Ft. Long. Equipped With a 6-Cyl. Sterling Engine; Speed 28 M.P.H.



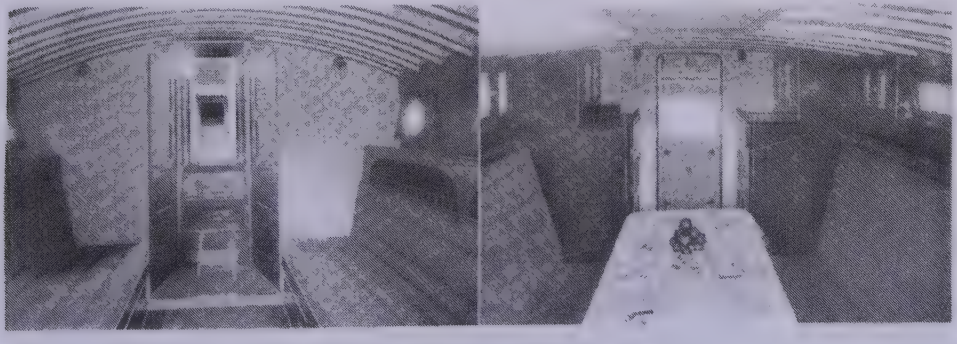
Gitana, Philip de Bonde, Owner. 50 Ft. Long, Built by the Great Lakes Boat Corporation, Driven by a 6-Cyl. Van Blerck Engine of 200 H.P.

The accommodations are very complete, as the pictures will show. Every inch of room in the boat is put to some good use and it is possible to comfortably accommodate a party of eight and a crew of two without inconvenience or overcrowding. A similar boat, exhibited at the power-boat show in the Grand Central Palace last Winter, proved a very popular attraction.

Dr. F. L. Humphreys's Kiva

Kiva, a seagoing cruising power yacht, recently has been completed at the yard of Smith & Williams Company, Salisbury, Md., for Dr. Frank Landon Humphreys, of New York. The designs were drawn by J. Murray Watts, of Philadelphia. This yacht is 87 feet long, 17 feet breadth and 4 feet draught, so that it can be used to advantage in Florida waters. The power is furnished by two six-cylinder, 6½ by 9-inch heavy-duty Sterling engines of 70 h.p. each, driving twin screws.

The general arrangement shows a large deckhouse with a pilothouse at the forward end and a smoking room or lounge at the after end. There is a dining room 17 feet long just forward of the lounge and connecting with the dining room a large pantry and galley. Below decks there are two large staterooms, two bathrooms, and a library 16 feet square, with a big open fireplace and Colonial mantel. The engine room is about amidships, and the lower storeroom, staterooms for the officers and quarters for the crew are forward. An electric player-piano is fitted in the library. The equipment on this yacht is unusually complete. There is a separate Mills electric light plant of 110 volts capacity, and 56 cell storage batteries installed in a special watertight casing, allowing current to be obtained at all times without running the generator engine. On the pilothouse is mounted a 14-inch Carlisle & Finch 110-volt searchlight, and in the main storeroom below decks there is an Isco electric icemaking plant. For heating the boat, besides the large open fireplace in the main saloon, there is a



Cabin of Gitana Looking Forward and When Used as a Dining Room



Kiva, Dr. Frank Landon Humphreys, Owner; 87 Ft. Long, Designed by J. M. Watts; Built by Smith & Williams Company

hot-water heating plant with radiators in all the living rooms, as furnished by the American Radiator Company. Another piece of mechanical equipment of interest is the power-driven windlass, which is operated by means of a clutch working off the flywheel of the starboard engine, and driving the windlass by means of a worm gear and counter shaft. This will enable the owner to get up his anchor under ordinary circumstances in from five to ten minutes.

The deck beams in the main deck have been especially strengthened fore and aft so as to be able to carry rapid fire guns, should she be used as a patrol boat in war time; her forward and after decks being unencumbered by awnings. The yacht is equipped with four sets of davits and carries a mahogany, fine finished launch, crew's launch, and two small tenders. The boat carries no auxiliary sails, but there is one military mast aft for signal flags and wireless. The general appearance of the boat shows a high freeboard, seagoing type of vessel with a good-sized deckhouse amidships and plenty of deck room fore and aft, and extra wide side decks. The figurehead represents an Indian and was modeled and cast in bronze by the owner.



Satellite, 60-Foot Lobster Smack, Powered With Two 36-H.P. Gray-Prior Engines; Speed 9 Knots

A Jitney Ferry

For the last year or so the "automobile jitney" has been a source of decided interest, because it has proven the novelty of the present automobile age. Nearly every city in the United States boasts of one or more automobiles in such service. However, it remained for a citizen of Savannah to introduce the "jitney ferry."

From East Broad Street, Savannah, to Screven Ferry, South Carolina, this unique "jitney" operates. The main boat is large and heavy and it is propelled by an Evinrude detachable rowboat engine. Two large bateaus are towed and accommodate the carrying of the passengers and freight. Good time is made between the two stations and no load seems too heavy for the Evinrude. Five cents for each person and five cents per 100 lb of freight is charged. According to report, the operator found the "jitney ferry" a paying proposition. The low cost of operation of the outboard engine has made the running expenses a small item.

From the success promised the first "jitney ferry" it is not improbable that Savannah, in a short time, will have a regular "jitney fleet" in operation.



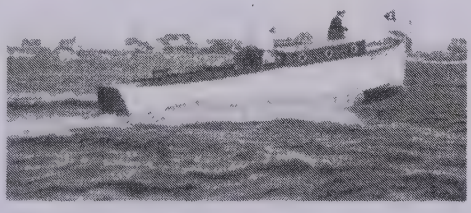
Scout Patrol 56, Sold to the Navy by Rear-Commodore H. S. Vanderbilt for $1.00; 72 Ft. Long; Built by Murray & Tregurtha; Designed by Swasey, Raymond & Page; Equipped With Two 8-Cyl. Duesenberg Engines of 400 H.P. Each



"Jitney" Ferry at Savannah, Driven by an Evinrude Outboard Engine

Echo III—a Wilmington Cruiser

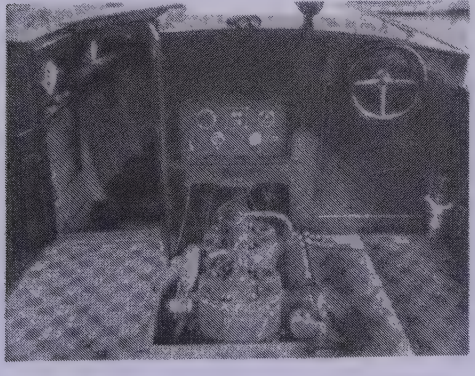
At Wilmington, Del., the du Pont family has set the fashion for fast power boats. The famous family of Tech Jrs. had their being in Wilmington, although their racing was done wherever there happened to be a race. Following the excitement caused by the births of the various Techs came the announcement that Alfred I. du Pont had purchased a 40-foot military type express cruiser which he christened the Petrel. Wm. Beadenkopf, of Wilmington, was one of the first well-known yachtsmen to place his order for a 30-foot express cruiser, named Echo III. This boat was designed by Wm. H. Hand, Jr., and had just the right accommodations for use in and around Delaware Bay and adjacent waters. This boat was powered with a four-cylinder, 5½ by 6-inch Van Blerck engine, with full electrical equipment, and made just 22 miles an hour. Normally the engine turns about 1,100 r.p.m. and operates a 21 by 22-inch three-blade Columbian-Ailsa Craig propeller. The engine is placed in the open cockpit but efficiently encased by an asbestos-lined box quickly removable. For ordinary cruising this box remains over the engine, but in long runs, or races, etc., the box is removed and the engine given every opportunity to run at a reasonable temperature. By placing the engine in the cockpit in this way, the forward cabin is left absolutely clear, thus affording ample accommodations for a boat of this size and type. Mr. Beadenkopf's brother, C. M. Beadenkopf, chose the open type of boat and had a 30-foot Hand V-bottom type of open fishing boat built at the same time as Echo III and christened her Blue Hen. The power plant of this boat is also a four-cylinder Van Blerck, which turns a 21 by 22-inch Columbian-Ailsa Craig wheel at 1,200



Echo III Making 22 Miles an Hour

r.p.m., which gives the boat a speed of just a trifle over 23 m.p.h.

Echo III and Blue Hen, with other yachts of the express cruiser type, will take part in the races arranged for Chesapeake Bay this season, and in all probability will compete in some of the Delaware River events.



Engine Installation of Echo III, One 4-Cyl. 55-H.P. Van Blerck



Cockpit of Echo III Showing Covering Over Engines

Barometers and How to Read Them

By P. Richard Jameson, F. R. Met. Soc., F. R. S. A.

Mr. Jameson has written a book on "Weather and Weather Instruments," and a booklet entitled "Practical Hints for the Amateur Weather Forecaster," which have been published and copyrighted by the Taylor Instrument Company, of Rochester. The barometer and weather always make interesting studies for all yachtsmen and with the consent of Mr. Jameson, the following article on barometers is published herewith.

THE atmosphere surrounding the earth may be regarded as an "ocean" of air extending upward from the earth's surface. Obeying the law of gases it exerts, in all directions, a pressure varying according to the density of the air. It is impossible to tell accurately to what height air extends. Formerly some authorities claimed eight miles, while others said from 40 to 50 miles.

The existence of an atmosphere at more than 100 miles above the surface of the earth is revealed to us by the phenomenon of twilight and the luminosity of meteors and fireballs.

Should you measure off the "ocean of air" in layers of equal thickness, the top layer would naturally be lightest because it is not weighted down and compressed by any layers above. Each succeeding layer would increase in weight until the earth is reached. This layer is heaviest, as it must support the entire volume of air above.

It is almost out of the question for a man to ascend higher than five or six miles because of lack of air to breathe. At six miles, it is too thin to supply a human being with the requisite oxygen for breathing. At great heights the atmosphere becomes more and more attenuated and thins out by insensible gradations into perfect vacuum. There is no definite boundary, immediately above which there is none. The pressure at an altitude of a few miles is very small, decreasing with increase in altitude, as the higher the ascent the less air remains.

The air at sea level weighted down by the air above it, exerts a pressure of about 14.7 pounds per square inch of surface. The pressure on a grown person (average 16 square feet) would be about 35,000 lb. Were it not for the ease with which the air (under this pressure) penetrates the body, very slight changes in pressure would prove disastrous.

Like terrestrial solids and fluids, the atmosphere is held in place by the attraction of the earth. As the area of the earth's surface is one hundred and ninety-seven million square miles, or seven hundred and ninety quadrillion inches, the total weight of the atmosphere is eleven and two-thirds quintillion pounds. Of the enormity of these values, some idea may be obtained by instituting a few interesting comparisons. One million trains each composed of one million powerful locomotives would represent but the hundredth part of the weight of the atmosphere. A leaden ball equal in weight to the atmosphere would have a diameter of 60 miles.

This law being known, its principle is used in measuring the height of hills and mountains by means of barometric observations at the two points.

The theory of the mercurial barometer is exactly the same as that used by Torricelli, its inventor, in 1643. If a glass tube, closed at one end, 34 to 36 inches long, be filled with mercury, and inverted into a cup of mercury, the mercury in the tube will be seen to fall in the tube to a height at sea level approximately 30 inches, irrespective of the length of the glass tube. The height is measured in inches from the level of the mercury in the cup to the level of the mercury in the tube.

The weight of the air on the mercury in the cup holds the mercury at a certain height in the tube. When the pressure is released a trifle of the mercury in the tube will naturally fall and will rise when the pressure is increased. As mercury expands or contracts when the temperature increases or decreases, corrections to the mercury column are necessary before a true reading of atmospheric pressure can be arrived at. Standard temperature is 32° Fahr. or 0° Centigrade.

Another correction is adjustment of the cistern. Naturally, in a modern mercury barometer a cup is not used, as described in the previous paragraph, but instead, the mercury is placed in a cylinder of glass, the barometer tube passing through a neck into it. A small ivory point is fitted inside the top of this glass cylinder and before a reading can be taken the mercury has to be raised or lowered in the cylinder (by means of an adjustment underneath), so that the exact level of it just touches the ivory point. If this is not done carefully and accurately the readings will be erroneous. There is a small correction for gravity, which also must be taken into consideration, and also one for mensicus. Mercury will not wet glass, but as capillary attraction depresses the column and gives it a rounded top, it is necessary to determine what the reading would be if the mercury column were cut straight across instead of being rounded. This is called Mensicus Correction. The metal scales upon which are engraved the inches of pressure, are affected by temperature, being longer when warm and shorter when cool. A correction has also to be applied here. When all these corrections have been found and applied to the reading of the barometer a true reading of the atmosphere has been taken. In a high-grade compensated aneroid barometer, all corrections are taken care of in construction, and the observed reading on the dial is the true reading.

The word aneroid is a Greek compound expressing "without fluid," thus distinguishing this barometer from one which measures the pressure of the air by means of a mercury column. The aneroid is so arranged that the pressure of the air actuates the upper surface of a vacuum chamber, which is perfectly balanced between this pressure and a mainspring. The vertical action thus given to the vacuum chamber is multiplied and transmitted to an index hand moving over the dial, which has been graduated into divisions (inches and fractions of an inch) to agree with the scale of the mercurial barometer.

The aneroid barometer is the best instrument that can be devised for marine use, not only on account of its extreme sensitiveness, but also because it is not affected by the motion of the vessel. It is now recognized as a necessity for the mariner and is made in many compact forms for use in yachts. An aneroid barometer may be out of adjustment so far as not agreeing with the reading of

a mercurial barometer, and still give accurate measurements of the amount of change in atmospheric pressure. It is more satisfactory to the observer, however, if his instrument be compared with a standard mercurial barometer. If they do not agree, the aneroid may be adjusted by turning the small adjusting screw until the indicating hand on the dial coincides with the height of the mercury column. It should, however, never be moved more than 0.3 inch. The finest quality of barometers require a slight adjustment at the end of, say, six months, and then once in nine months. After a time they become so nearly permanently accurate that they require no resetting.

It was not until 1643, twenty-three years after the landing of the Pilgrims on Plymouth Rock, that Torricelli discovered the principle of the barometer. Torricelli's great teacher, Galileo, died without knowing why nature, under certain conditions, abhors a vacuum, but he discovered the principle of the thermometer. The data from the readings of these two instruments form the foundation of all meteorological science.

As soon as men began to observe the barometer attentively, they began gradually to recognize that the rising and falling of the barometer had an evident connection with the weather. It was Otto von Guericke, of Magdeburg, who first used the barometer as a weather glass. He applied, even then, to his water barometer the weather scale, which is at present in such general use, on which the highest reading occurring at any place is designated as "fine weather," the lowest reading as "rain and wind," etc. The barometer as a weather glass has taken its course throughout the world, and is today used almost universally.

About 100 years after the invention of the barometer (1747) Benjamin Franklin divined that certain storms had a rotary motion and that they progressed in a Northeasterly direction. Although his ideas in this respect were more important than his act of drawing the lightning from the clouds and identifying it with the electricity of the laboratory, his contemporaries thought little of his philosophy of storms. It remained for Redfield, Espy, Maury, Loomis and Abbe, one hundred years later, to gather the data and completely establish the truth of that which the great Franklin had dimly yet wonderfully outlined. We speak of weather as meaning atmospheric condition as shown in the meteorological element of a particular time, for a day, a season or even a year. Climate is the aggregate of weather conditions. The sun regulates our weather; it gives rise to Winter and Summer; by evaporation it raises the aqueous vapor into the air, and this vapor, by cooling, produces clouds, rain, snowstorms and hail; it is the primary cause of the differences in atmospheric pressure, and in this way produces the winds. This heating influence of the sun, as also its modifications by cloudiness, by the wind, by the change from day to night or from Winter to Summer, and by the properties of the earth's surface, which, consisting as it does of water and land, either covered with vegetation or barren, has varying capacities for absorbing the sun's heat. This influence of the heat of the sun has been established with most absolute certainty by the most exact observations.

The meteorological elements are the temperature, the barometric pressure, the humidity, precipitation, evaporation, the wind, the clouds and the electrical conditions of the air.

Aerial meteors are winds, hurricanes, whirlwinds, etc.

Aqueous meteors are fogs, clouds, rain, dew, snow, etc.

Luminous meteors are lightning, the rainbow and the Aurora Borealis.

To make a good forecast it is essential that the observer take into consideration the direction and force of winds, appearance of the sky, humidity of the air and a comparison of the barometer reading with the indicated pressure for several days preceding.

The wind which causes the barometer to rise and fall has more to do with the weather than the prevalence or deficiency of sunshine. A shifting of the wind is the most trustworthy of weather forecasts. A rise in the barometer shows that heavier air is drifting to a place just before occupied by light air. A heavy air is air that has been condensed by cold, a rise in the barometer indicates a cold wind.

A fall in the barometer shows that light air is drifting to a place just before occupied by heavy air, or, in other words, a warm wind is blowing. A falling barometer



Amalia III, Carl Reinschild, Owner. 60 Ft. O. A., 55 Ft. W. L., 13 Ft. 6 In. Breadth, 3 Ft. 6 In. Draught. Power, 4-Cyl., 6½-In. x 8½-In. Twentieth Century Engine

usually indicates a high or a low atmospheric pressure existing near at hand. The fall is then due to the gradual drifting up of the lighter air and the drifting away of the heavier air in the giddy whirl of some aerial conflict. A falling barometer shows that lighter pressures are approaching the station of the observer.

Whoever has provided himself with an instrument inscribed with weather words and believes himself to be the possessor of a self-registering weather prophet is generally highly indignant if it rains when his barometer stands at "fine," or astonished if it is fine weather when the barometer says "rain." The reading 29.5 (29½ inches) was at one time assumed to be the midway line separating "fair" from "rain" and was accordingly marked "change"; 30 inches was marked "fair"; 32 inches "very dry"; 28.5 inches "rain," and 38 inches "stormy." A fixed standard was thus assumed for a condition of nature that is literally as unstable as the wind. It was supposed that the instruments were to be used only in places about at the same level as the surface of the sea.

One thousand feet of altitude represents, roughly, an inch of pressure on the barometer. So that if two barometers were placed, one at sea level and the other at an altitude of 1,000 feet, the one at sea level might read "fair" while the other, under practically similar meteorological conditions, would read "rain."

Even at the sea level, if a barometer which has been standing at, say, 30.9 inches for some days, suddenly fell to 29.9 in twenty-four hours, it would give positive indication of change, intimating the approach of strong wind and probably rain, yet according to the dial, it would read "fair." In a similar manner, if a barometer that had been standing at 28 inches for some days, rose in about twenty-four hours to 30 inches, it would indicate the approach of a cold, dry wind, although the dial would read "rain."

A single observation of the barometer without reference to the conditions prevailing at definite intervals is liable to be misleading. The important thing to know is has the rise or fall been a gradual one or has it been rapid? If the barometer is stationary, how long has this condition existed? Weather prognostications from barometer observations are based on a knowledge of all these conditions, and never from a single observation.

A rapid fall or a rapid rise intimates that a strong wind is about to blow, and that this wind will bring with it a change of weather. What the precise nature of the change is to be must, in the main, depend upon the direction from which the wind blows. If an observer stands with the wind blowing on his back, the locality of low barometric pressure will be at his left and that of high barometric pressure at his right. With low pressure in the West and high pressure in the East, the wind will be from South; but with low pressure in the East and high pressure in the West the wind will be from the North.

The barometer rises for Northerly wind (including from Northwest, by the North, to Eastward) for dry or less wet weather, for less wind, or for more than one of these changes—except on a few occasions when rain, hail or snow comes from the Northward with strong wind.

The barometer falls for Southerly wind (including from Southeast, by the South, to Westward) for wet weather, for stronger winds or for more than one of these changes—except on a few occasions when moderate wind with rain (or snow) comes from the Northward.

The above applies to readings in the Northern hemisphere. The readings in the Southern hemisphere are practically the reverse of these.

For change of wind towards Northerly directions a thermometer falls. For change of winds towards a Southerly direction the thermometer rises. Moisture or dampness in the air, shown by a hygrometer, increases before rain, fog or dew.

A gradual but steady rise of the barometer indicates settled fair weather.

A gradual but steady fall indicates unsettled weather.

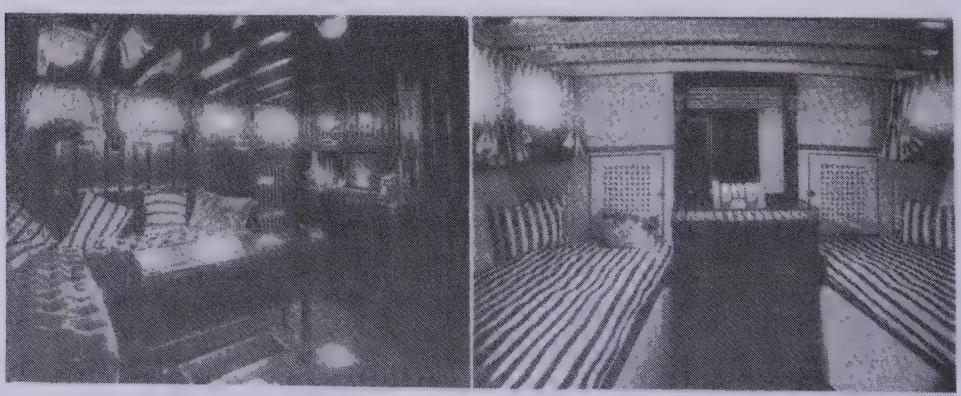
A very slow rise from a low point is usually associated with high winds and dry weather.

A rapid rise indicates clear weather with high winds.

A very slow fall from a high point is usually connected with wet and unpleasant weather without much wind.

A sudden fall indicates a sudden shower or high winds or both.

A stationary barometer indicates a continuance of existing conditions, but a slight tap on the barometer face will likely move the hand a trifle, indicating the tendency to rise or fall.



Interior Views of the Amalia III, Designed and Built by the New York Yacht, Launch & Engine Company for Mr. Carl Reinschild

A Cruise on Barnegat Bay

By the Skipper

TO those who have been cruising on Barnegat Bay this little account of a four-day trip may serve as a reminder of pleasant days spent on that unique stretch of water. To those who have not cruised there or who have never been on the New Jersey Coast, it may be of interest as giving a faint idea of the large shoal bays and connecting thoroughfares which run from Bay Head to Cape May, separated from the ocean only by a strip of sand and dunes which vary from a few hundred yards to a mile or so in width.

For the past few years the Mate and I had heard of the Mullica River but with the exception of a few of the fisher-folk we had never met anyone who had been there. Several trips to the river had been planned but it was not until the middle of last Summer that our plans assumed definite shape.

Our boat was a sloop of 20 feet water-line and 30 feet over all, having a draught of 2½ feet with the centerboard up. She was light and fast but very able, and had a small cabin meant more for day sailing than cruising. We spent Saturday and Sunday in fixing things cosy for the trip and on a Monday morning early in September we were ready.

The clouds of the early morning soon passed off and it was a clear, hot day with a very light Southwest breeze when we cast the Portia lose from the Bay Head Y. C. dock about 10:30 o'clock and headed South. We made poor headway in the light air as we had to tack down the narrow Government channel which, for the first two miles, is only one hundred feet wide with hard sand just outside the bushstake buoys.

By noon we were off Chadwicks and a freshening breeze was blowing from the West. Being in a hurry to make up for the time lost through the light winds of the morning, we decided to cut the flats. I went too close to Good Luck Point though and soon heard the centerboard grate as it scraped into the sand.

Portia was running with the wind on the quarter and I immediately eased off for deep water. The Mate hauled up the centerboard rope but to his dismay found no board on the end of it. Looking into the well he could see that the board was still there, although way down and causing a heavy strain on the pin. He passed a rope under the bow, hauled in and got the board part way up, at least far enough so that there was no danger of the strain breaking the pin and our losing the board entirely.

After a brief argument it was decided to put in to a boatyard at Island Heights and have a new rope rove in. We tacked back, carrying a luff, to a yard at the East end of the town. Here we were soon hauled out on the ways and the men put in a new rope while the Mate and I scrubbed the topsides and water-line.

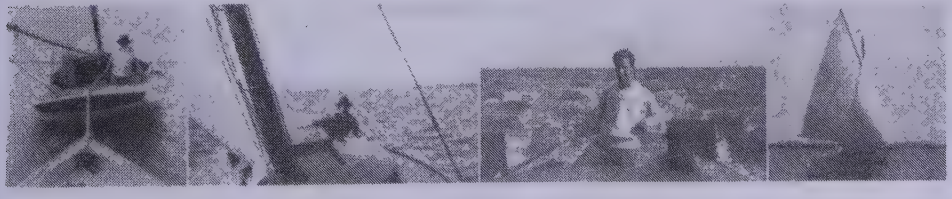
An hour or so later we were off again in a light Northwest wind, the Mate at the tiller. We passed through the railroad drawbridge at Barnegat Pier with a light stern breeze and ebb tide helping us along and stood out into the main bay.

The run to Forked River was uneventful and beautiful. There was a gorgeous sunset with the marshmallows and glorious banks of the creeks and bays to the West, and at the East a long stretch of open water with the sand-dunes and ocean on the other side about four miles away. Off Cedar Creek Point the half-moon began to shine and across the bay we saw the flash of Barnegat Light. The wind had dropped completely and we ate supper and drifted down the bay with the tide, in perfect happiness.

About eight o'clock, with a faint land breeze from the West, we sailed into the "Old Homestead," as we always call it, a sheltered cove on the South side of the mouth of Forked River, and anchored just inside the point. The sloop was soon stowed for the night and the Mate and I got out our pipes and listened to the victrola of a nearby power boat before turning in.

After a few hours sleep the Mate awoke to find the sloop pitching and pounding heavily and, going on deck, discovered a strong breeze blowing from the Northeast, the only point from which we were not protected. The sky was clouded over and a nasty sea was rolling into the river. He gave the anchor more cable and, cursing the weather, turned in again. About two o'clock both he and I awoke with Portia's hard motion. The riding light had been jumped out and the main-boom was thrashing in the crotch, threatening to come loose at any minute.

I took a look around and at once decided to move up the river. Accordingly we put on our sweaters and prepared to reef the mainsail. It took a long wrestle to tie in the gaskets and reef points but finally we hoisted a three-reefed mainsail and, weighing anchor, stood up around the first point of the river, into calm water, where we hastily made the sloop snug, and continued our slumber.



Four Views of the Portia Cruising on Barnegat Bay

Tuesday morning we turned out to a cold and beautiful day with the strong Northeast wind still blowing. After a hearty breakfast and a clean-up we got underway with the three reefs in the mainsail and no jib. We rounded the buoy off Forked River at 8:10 and headed South, almost due before the wind, and running with the heavy seas. We easily picked up the channel to Harvey Cedars, which we passed one hour and ten minutes after leaving the river, and headed down the narrow channel for the "Cedar Bonnet." This is probably the worst spot North of Atlantic City. Here at the town of Manahawken the railway and road drawbridges are very narrow and so close together that when open there is very little space between the ends. Just South of them the channel is very narrow and after describing a perfect double S goes to the West, gradually opening out into Little Egg Harbor Bay.

We came about just before reaching the bridges and after dropping the peak trimmed in the main-sheet as far as we could without jibing, as the bridge was too narrow to allow us to go through with our sheets eased all the way. We went through safely notwithstanding the treacherous back draughts that frequently occur to leeward of the drawbridges. Then we worked through the bonnet over to the West side of the bay and again ran South before the strong wind down Little Egg Harbor Bay. Watches were changed every half hour or so, for it was cold, hard work keeping Portia steady on her course. At eleven we were off Beach Haven and decided to put in there for lunch and to ask information regarding the channels. We anchored off the Yacht and Gun Club at a little before noon, just three and a half hours after leaving Forked River.

The Mate set things to right a bit, while I, being skipper, put on a shirt, necktie and coat. After sending a few post-cards and eating lunch, we inquired the best route to the Mullica River from some of the "heckees," as we always call them, from their frequent use of the phrase "by heck."

The natives of the South Jersey Coast are a unique people. As we sat and talked to a "party captain" there on the dock, I was reminded of a story of some friends of mine who were making their first trip to Atlantic City. They had a 30-foot cat and were crossing Great Bay when, passing an oysterman in a small garvey, they called, "Where's the entrance to Main Marsh Channel, Cap?" The man pointed across the bay and replied, "Ye see them three houses over yonder? You head straight for them and nothin' short of God's earth'll stop ye!" They did so and had not gone a hundred yards before their centerboard struck the edge of a small flat. The oysterman stood up, called, "I told ye nothin' short of God's earth would stop ye!" and resumed his work.

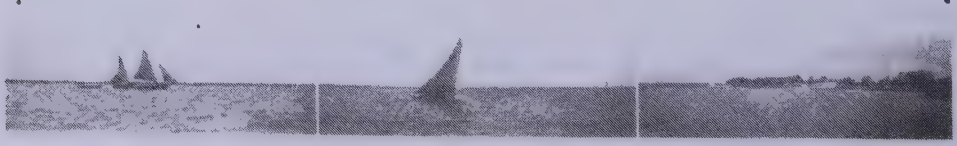
At 1:30 we again hoisted our reefed sail and headed down towards the New Inlet. Here the high wind and strong flood tide created a big sea and Portia jumped and yawed at a great rate, giving us plenty to do when we came about just inside the inlet, and headed for the thoroughfare leading to Great Bay. Once in it we felt the full effect of the fair tide and with the wind just abaft the beam the sloop ran up the Shooters Thoroughfare at fine speed. We had to do a little windward work to get past the fish factory and up into the Northern end of Great Bay. Then we described a big semi-circle to clear the sand-bars, eased sheets and squared away for the mouth of the Mullica River; its low woody point just visible about eight miles in the West side of the bay.

The South shore of the river at the entrance being the best water, we ran well past the entrance before turning North and preparing to follow its peculiar reaches; for, as our friend had told us, it was "as crooked as a dog's hind leg." The water was nearly thirty feet deep to within a few yards of the banks and we traveled at least seven miles to reach the iron drawbridge of the main county road, which we could see about three miles over the meadows. In one place the river doubled back to within one hundred feet of the turn below, as we could see from aloft.

The wind was very much lighter here and as it was nearing sundown we shook the reefs and, being still in tide water, Portia made good time, although we had to watch her carefully in the puffs which came without warning over the meadows. Above the drawbridge the river was quite narrow and the woods came closer to the banks with few meadows. As we sailed along admiring the quaint river, it seemed hard to believe that we had had such a strenuous day in the open bay.

Finally just as the sun set and the moon appeared to the East we sailed slowly into a sort of small bay with an old, low wooden drawbridge across the upper end and a cluster of houses along the North bank of the river. And here at Lower Bank we anchored. As we furled sail in the twilight a young girl drove three cows across the bridge, their bells alone breaking the silence of the little cove.

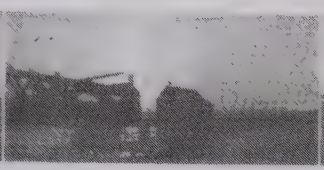
At seven o'clock the next morning the Mate announced a clear, cold day with a fresh Northwest wind. After breakfast we had a big cleaning and airing of the entire cabin. Then we went ashore, visited the funny country store and post-office, had our tintypes taken by a traveling photographer for the sum of five cents each, and returned aboard ship. As it was blowing hard we put a double reef in the mainsail and set the baby jib. It took an unusually long time to do this, however, as two attractive (through the glasses) girls were disporting themselves on the drawbridge, and the crew wavered long between love and duty, but finally duty won and Portia's bow was headed down the river. After a brief encounter with a mud bank we sailed uneventfully downstream. When near the iron drawbridge, however, the jib sheets parted in a particularly heavy puff and the



Bugeye Off Cedar Point Barnegat Racing Cat View Up Forked River



Drawbridge at Lower Bank



Mantoloking Drawbridge



Barnegat Pier Drawbridge

Mate was called from his comfortable seat in the cabin to repair damages.

Lunch was eaten underway and after changing the "watches" and battening down everything we stood out of the mouth of the river and felt the full benefit of the wind and seas. We made a long tack out Easterly across Great Bay, for out here the wind was nearly Northeast.

A brief consultation with the charts made me decide that we could stand right across the bay. So, with an improvised lead line in use, we held our course, and picked up the Government channel at buoy 50, halfway between Main Marsh Channel and the thoroughfare down to the New Inlet.

Here we fell in with our friend the catboat Zelda of Bay Head, returning from a trip to Atlantic City. The wind fell lighter and, as we were bucking a strong tide, Portia made slow time beating to the buoy in the Inlet, being left astern by Zelda, which used its power dinghy to push. However, once past the inlet buoy, we felt the flood tide and made good time tacking up into Little Egg Harbor Bay. Watches were changed again and I made myself comfortable below, leaving the poor Mate to freeze at the helm—and how cold one's fingers did get holding the tiller!

Late in the afternoon we dropped anchor off the Beach Haven Yacht and Gun Club and made everything snug for the night. A cold swim, a visit from the crew of Zelda, and then a glorious hot dinner were indulged in, after which the combined crews took shore leave.

The next morning was dull and overcast, with a damp Southeast breeze, which seemed to foretell the need of slickers before the day was done. As we finished breakfast we heard a voice hailing us and, going on deck, I saw Zelda sailing out with two reefs in the mainsail, and the power dinghy again pushing. It was just eight o'clock and her crew jeered at us for being so late in leaving port. We were soon underway and being anxious to show Zelda our heels, put on full sail. With our lee coaming nearly awash and a choppy sea rising, we made two short tacks and were clear of the harbor. Then the Mate folded and lashed down the anchor and received an unexpected wetting when two waves in particular broke over Portia's bow.

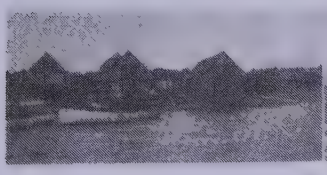
As we passed a party catboat I called out, "Going to have some rain today, Cap?" The man looked around carefully and then gravely remarked, "I don't reckon we'll git any rain, but we might have a shower afore sundown, though."

We turned the buoy in the West side of the bay and stood North with the wind on the quarter, tearing through the water nicely. We overhauled and passed Zelda near the upper end of the bay, much to their discomfiture, for they soon grew bold and shook their reefs. But on the run dead before the wind over to the Cedar Bonnet they repassed us, their power dinghy doing the trick.

Once through the drawbridges we got a beam wind and, hauling the dinghy up on the windward quarter, soon left them astern again. The wind grew fresher as we entered Barnegat Bay proper off Harvey Cedars and made a long windward leg towards Barnegat Town. Portia stood up in fine shape, worked well up to windward, and handled easily, although we had the advantage of being just to leeward of a number of marsh sedges which broke up the seas.

When we turned North, however, and ran along the West side of the bay the wind lightened and shifted, and by the time we reached Forked River it was a very moderate Northwest breeze. The clouds had all blown over and the sun was beating down warm and pleasant. Just North of the river we began to buck the ebb tide, making slow time indeed, and it seemed hours before we reached Cedar Creek Point, that long marshy neck which juts way out from the West side of the bay. Off the point we found the usual fishing fleet. Several party cats, a big auxiliary sloop, a few small open launches and three or four power boats. Zelda passed us, her power dinghy still pushing, while her sails held hardly any wind. Then we passed a bugeye slowly coming up the bay, her rakish spars and leg-o'-mutton sails contrasting sharply with the typical Barnegat catboats around us.

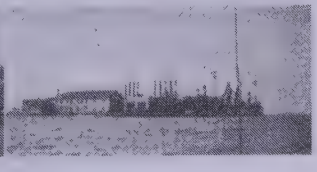
The light wind had now veered to about Northeast and we had to tack all the way. Barnegat Pier drawbridge was open and as we stood in towards it, a cat ahead of us rounded up and, running in alongside the open draw, her captain pulled her through by means of



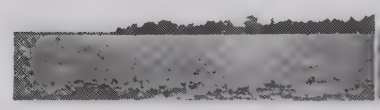
Boat Yard at Inland Heights



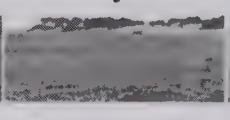
Bay Head Y. C.



Fish Factory in Greater Bay



Lower Bank on the Mullica River



Barnegat Light



Beach Haven Yacht and Gun Club

a rope hung along the edge of the bridge for that purpose. But we made Portia buck wind and tide and, taking a tack inside the draw, went through without assistance. From there on up to Bay Head the trip was uneventful. The wind fell lighter and lighter and, changing watches every hour, we slowly neared home. As the sun began to sink low I went below to investigate the state of the larder. We had indeed figured close to the mark. A piece of cheese, some coffee, a gallon of water and half a loaf of dry bread was all that was left. We had to get home or else go hungry, as even the Mate refused the idea of dry bread, cheese and coffee.

The sun set as Portia was a little below Mantoloking and with it the light wind died out, while over the dunes to the East the moon rose. Just as the afterglow settled into darkness we slid slowly through the drawbridge at Mantoloking—this time using the ropes—went a hundred feet or so and lost steerageway. It was the flattest calm I ever remember on Barnegat. And so the Mate and I alternated and towed Portia with the dinghy the last mile and a half to her mooring off the Bay Head Y. C. The cabin clock struck eight bells just as we made fast and a beautiful, quiet night it was. Around us the home fleet lay absolutely motionless, their hulls and rigging standing out grotesquely in the moonlight, while ashore the lights of the town shone familiarly.

Fifteen minutes later we packed our duffel bags, locked the cabin and rowed ashore, a hungry but happy pair. As we walked up to the cottage the Mate remarked, "That was a bully trip!" and I echoed his sentiments. Those marshes, sedges, shoals and sand-dunes of Barnegat certainly have a charm all their own, especially in September when the marshmallows are in bloom and the marshes are beginning to change color.



U. S. S. Montana, Armored Cruiser, Which Will do Scout Duty; Cost $6,707,000; Keel Laid in 1905; 503 Ft. Long, 72 Ft. Breadth, Displacement 14,500 Tons. Engines 27,900 H.P., Speed 22.26 Knots, Main Armament, Four 10-Inch and Sixteen 6-Inch Guns

Designs

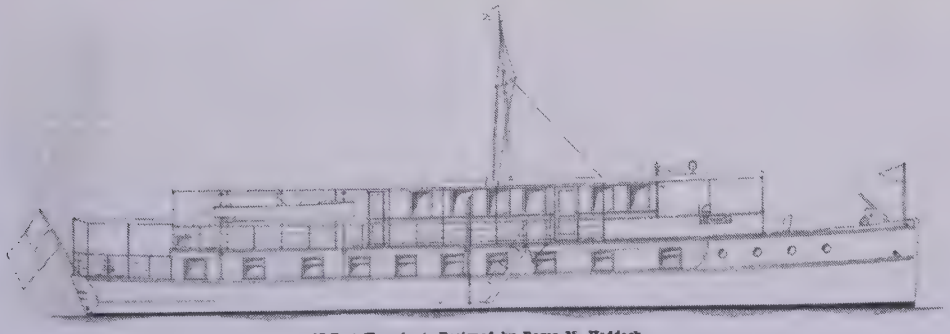
97-Foot Houseboat

The accompanying plans of the 97-foot houseboat were designed by Roger M. Haddock for McCoy Bros., of Daytona, Fla., the proprietors of the Indian River Line, which maintains service between St. Augustine and Palm Beach during the Southern Winter season. She is intended for charter in Florida waters in Winter and to be brought North for the same service during the Summers. With an over-all length of 97 feet, breadth of 19 feet, an extreme draught of 3 feet 6 inches was given her. As this might seem rather excessive for the Florida end it tends to secure a much better sea-boat and a much stronger hull for the general uses in Northern waters and in making the outside runs necessary along the coast.

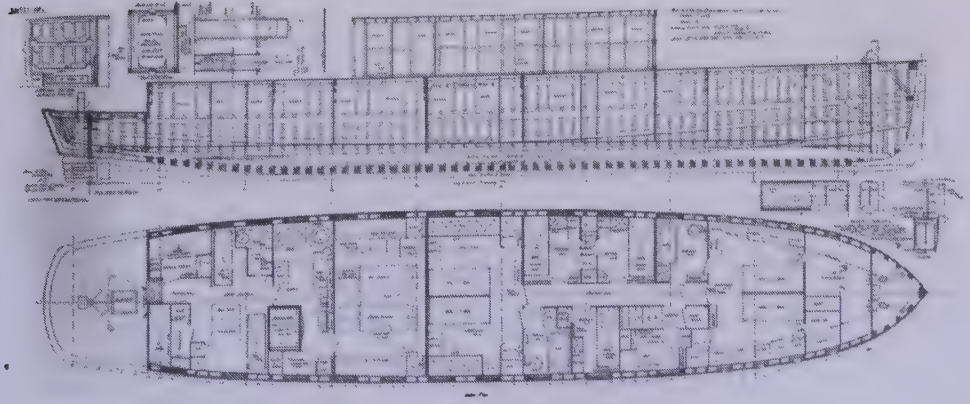
To the owners who are familiar with these waterways this draught, or even 4 feet, presents very little difficulties.

The writer spent two Winters in Florida with a boat drawing 3 feet 8 inches and had very little difficulty, even less than many boats that only drew 30 inches. The answer is that with the shoaler draught the feeling is that one can go most anywhere and find the water, while as a matter of fact the man with the greater draught will be more careful, paying greater attention to marks and avoiding cutting of corners.

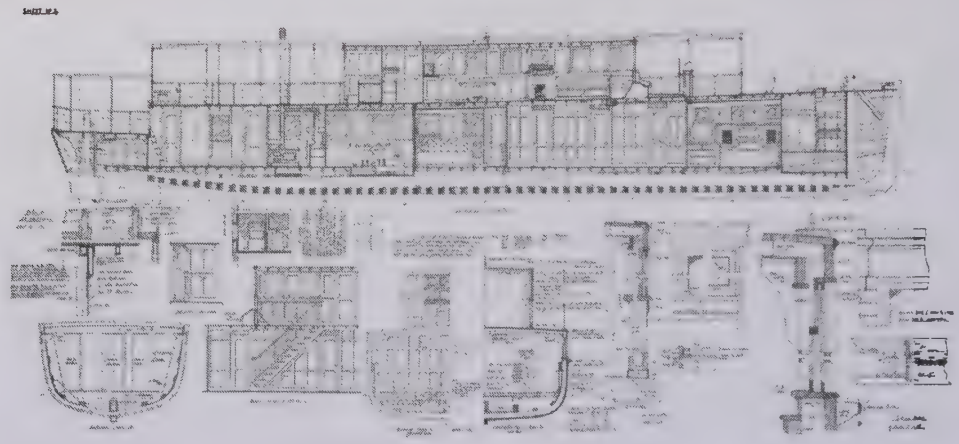
In general the construction is much heavier than is found in boats of this type. The keel 8 by 10 inches, laid on the flat and the keelson 10 by 16 inches, on edge, both of yellow pine. The frames of native white oak



97-Foot Houseboat, Designed by Roger M. Haddock



Arrangement Plans of 97-Foot Houseboat



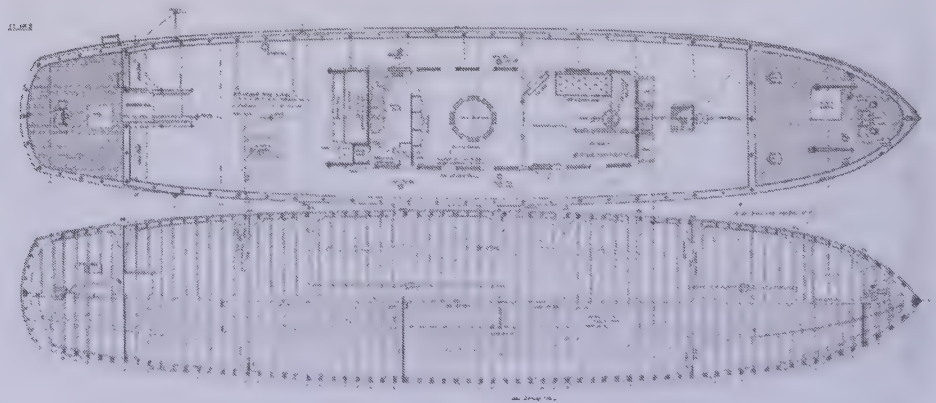
Construction Plans of 97-Foot Houseboat

are sawn, being made double, are 5 by 7 inches at the heels and 5 by 5 inches at the heads. Heavy clamps, side and bilge stringers, together with sister keelsons, all of good size and of long lengths of yellow pine are provided.

A solid 3-inch bulkhead ties the boat together at frame 41, and at other frames fore-and-aft, where a bulkhead could not be run, reinforcement in wood somewhat similar to web frames in steel construction. The forward portion of the boat is reserved for the use of the charterer and party, and consists of a large stateroom the full width of the boat forward, furnished with metal twin beds, bureau, chiffonier, writing desk, etc., and a large wardrobe on the starboard side under the fore deck. A door on the port side of beds gives access to a large trunk room.

Next aft on the port side is a good size bathroom with hot and cold, fresh and salt-water equipment, and opposite is a passage leading to the stairway to the deck saloon and also to a single stateroom on the starboard side. On the port side are two single staterooms and across the passageway one single room and another bathroom. Aft of all these, opening into the passage amidships, is a large stateroom the full width of the boat, which is furnished similar to the forward room, having in addition two sofas and two wardrobes. The after bulkhead of this room extends unbroken across the boat and divides the living from the operating department.

Aft of this bulkhead is the engine room, wherein are installed a pair of four-cylinder, 8 by 10-inch Standard engines, together with lighting plant, fuel tanks, workbench and lockers for miscellaneous uses. A lift to butler's pantry in the deckhouse also comes down into this compartment.



Deck Arrangement and Frames of 97-Foot Houseboat

Next comes the galley with its usual fittings and in addition the hot-water heating plant, with which the whole boat is heated.

Aft of the galley, crew quarters with comfortable accommodation for eight persons are provided.

A spacious deckhouse, 34 feet long by 11 feet wide, with a dining saloon, a lounging saloon and a butler's pantry, together with a shelter seat at the after end, is reached by a stairway from the forward end of the main passageway.

The rest of the deck space is given over to chairs, lounges, hammocks, tables and such deck furnishings.

While the main bulk of fresh water is carried in tanks under the flooring, there is an auxiliary tank of 265 gallons on deck to give gravity feed to all baths and lavatories, these latter being placed in every stateroom.

50-Foot Auxiliary Ketch

The plans of the 50-foot auxiliary ketch, Quatsino, shown herewith were drawn by Edson B. Schock for R. E. Montgomery of the Royal Victoria Y. C. and the boat was built by W. R. Menchious of Vancouver, B. C.

The boat was designed for the rough waters of the West Coast of Vancouver Island and the feature which strikes one at once is the pilothouse at the after end of the trunk cabin. The rig is small and well inboard, and in one very severe storm at Triangle Island when the wind attained a velocity of 55 miles she proved herself an able seaboat.

Entrance to below is through a companionway on the starboard side of the after end of the pilothouse, thence through a companionway to below on the same side at the forward end which leads into the main cabin. A berth is worked under the deck alongside the passageway.

The engine room is entirely bulkheaded off from the rest of the boat with access to it through a hatch at the forward end. Also a hatch in the forward end of the pilothouse. The 25-h.p. Sansom engine is located with the clutch partly under the pilothouse floor with all controls led above. A transom, work-bench and locker are worked in on the port side of the engine room.

In the main cabin are two large fixed berths with seats in front which can accommodate two extra people in a pinch. A locker is at the after end of the starboard berth with a buffet at the forward end of the port berth. There is a stove in the center at the after end of the main cabin and the table is in the center of the room.

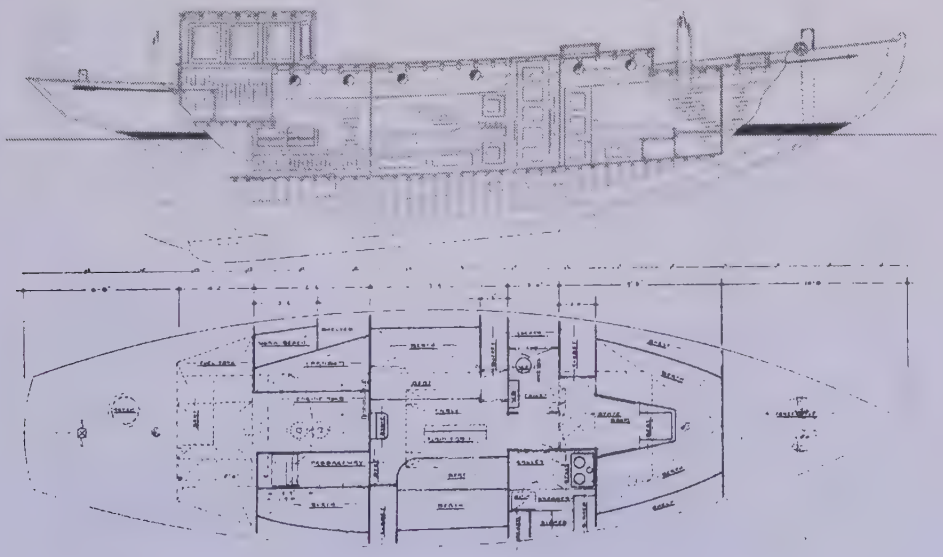
An enclosed galley with stove, sink, dresser, dish lockers, etc., opens off a passage between the main cabin and the stateroom forward with a toilet opposite with separate doors from each room.

The forward stateroom contains two large berths with a seat between forward and a locker at the after end on the port side.

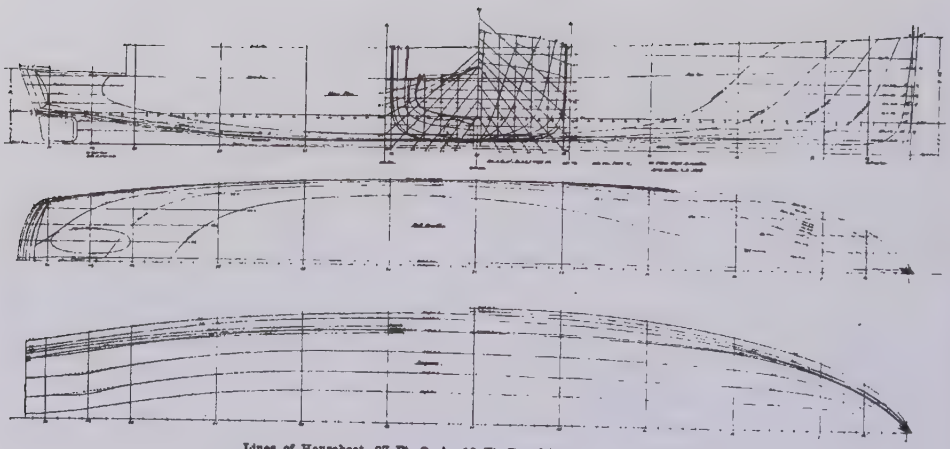
The sail is moderate. It is sufficient to move her along at a comfortable gait and the engine alone gives a speed of about 8 miles an hour.

The principal dimensions are:

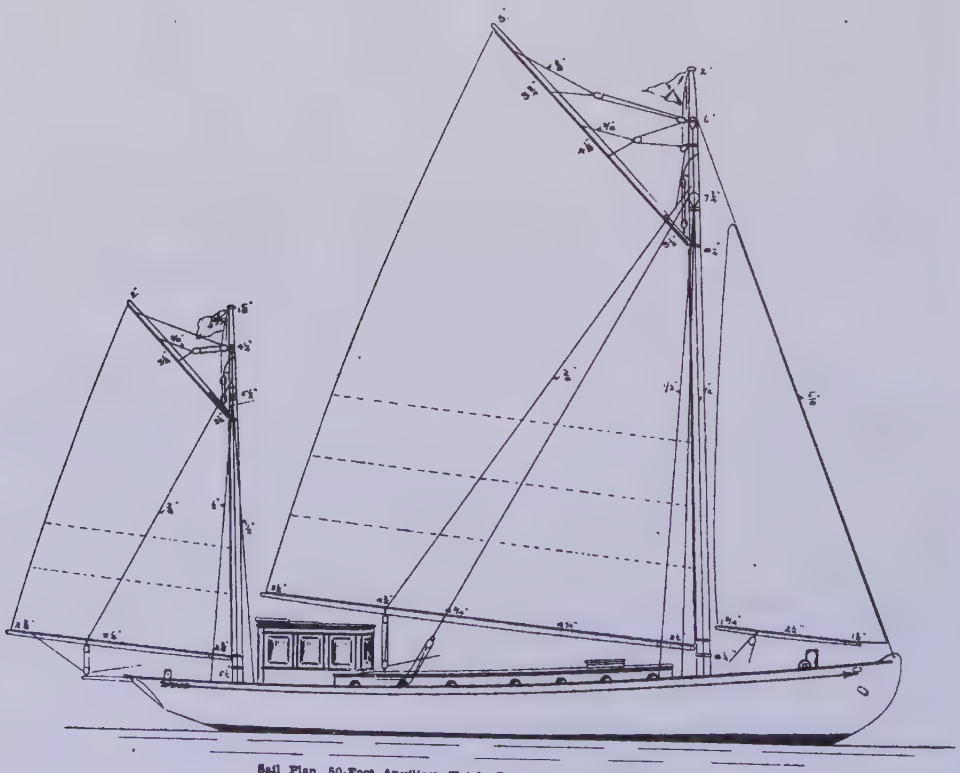
Length o. a.	50	feet	0	inches
Length l. w. l.	39	"	0	"
Breadth	13	"	7	"
Draught	7	"	0	"



Auxiliary Ketch, 50 Ft. O. A., 39 Ft. L. W. L., 13 Ft. 7 In. Breadth, 7 Ft. Draught



Lines of Houseboat, 97 Ft. O. A., 19 Ft. Breadth, 3 Ft. 6 In. Draught



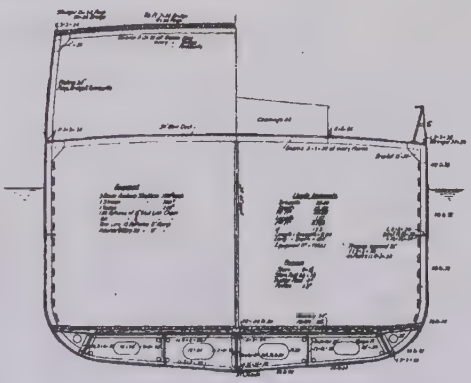
Sail Plan, 50-Foot Auxiliary Ketch, Designed by Edson B. Schock

166-Foot Cargo Vessel

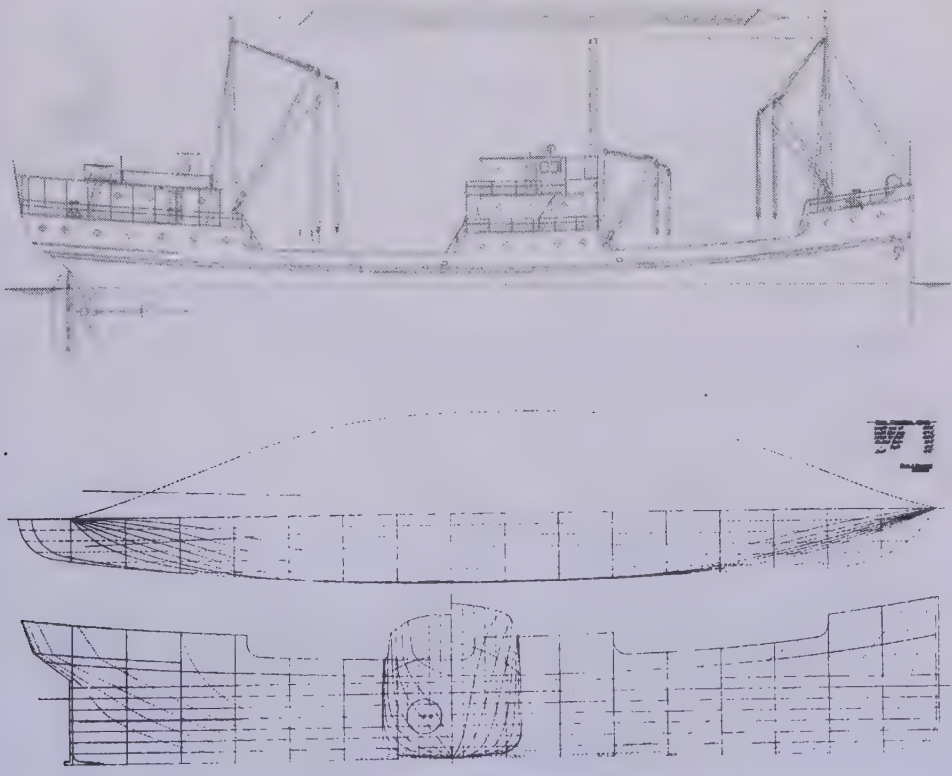
The special feature of the 166-foot cargo vessel, designed by Royal Polhemus, a student of Charles Desmond, is that it is an out-and-out American boat. It is American in design, American in build and will be driven by Craig-Diesel engines for propelling purposes and the Southwark-Harris oil engines for driving pumps and generators.

The design is an unusually interesting one and it is the first complete power vessel of American production that has been published in THE RUDDER. Just now there is great interest in vessels of this type. The United States Shipping Board has sanctioned the construction of several wooden vessels of 3,000 tons each which are to have as auxiliaries heavy-oil engines.

The vessel, the plans of which are printed herewith, was designed for special service where depth of water is limited and the cargo requirements do not exceed



Section Plan of Cargo Boat

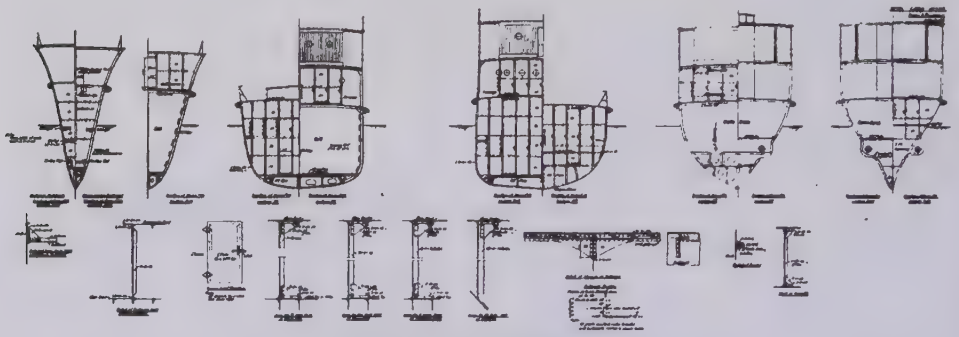


Lines of 166-Foot Cargo Boat, Designed by Royal Polhemus

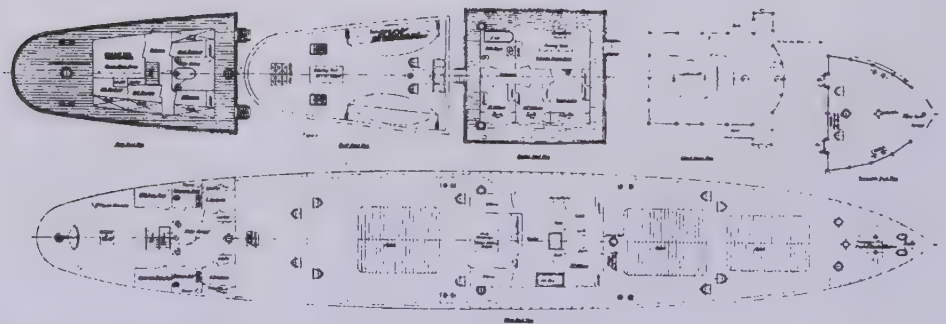
400 tons. The construction and installation of machinery is in accordance with Lloyd's requirements. The vessel will be driven by two eight-cylinder, 12½ by 15-inch reversible Craig-Diesel engines.

The principal dimensions are:

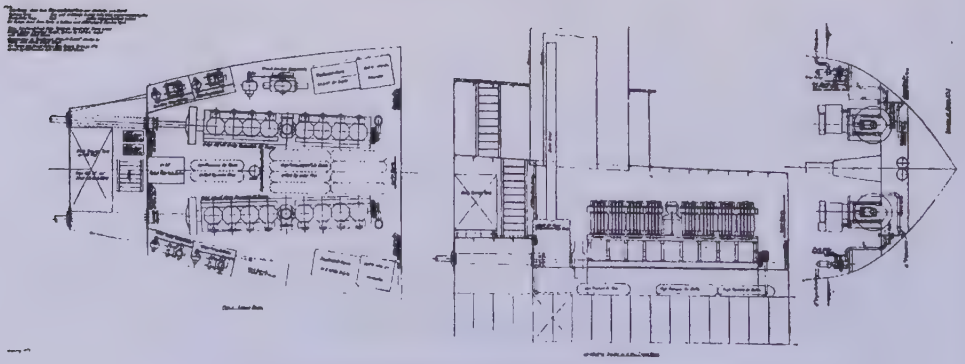
Length o. a.	166 feet
Length between perpendiculars	157 "
Breadth moulded	25 "
Depth moulded	15 "
Displacement at 12 feet draught	805 tons



Section Plans of 166-Foot Cargo Boat



Deck Plans of 166-Foot Cargo Boat

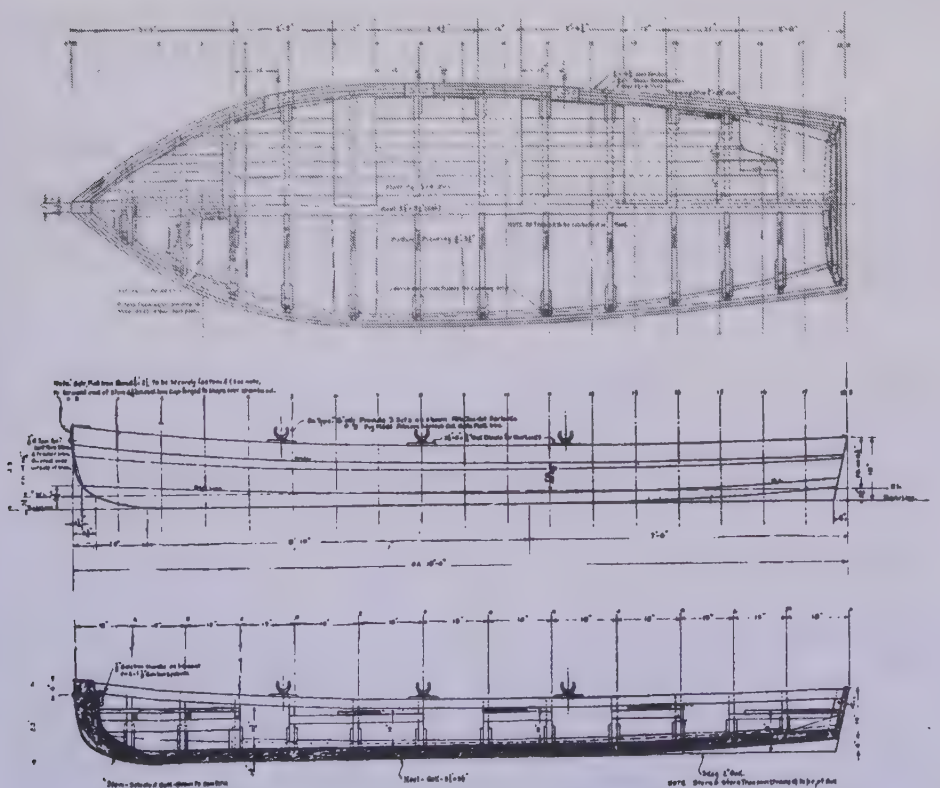


Engine Room of Cargo Boat Showing Installation of Two Craig-Diesel Engines

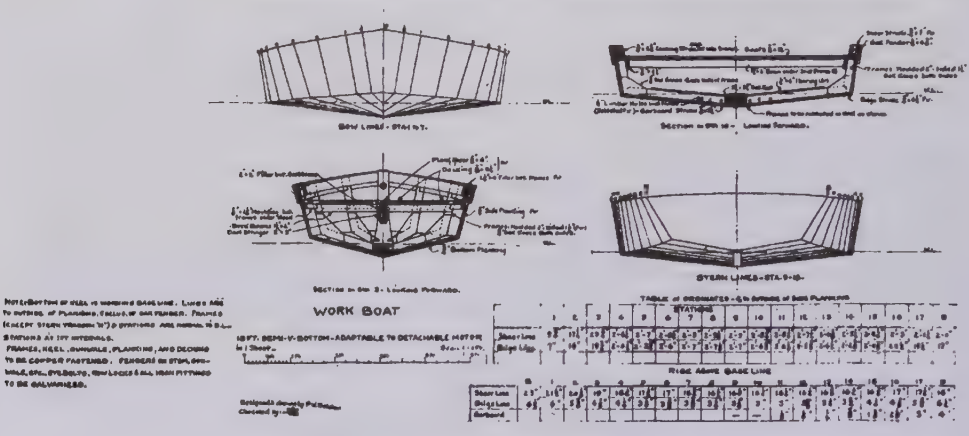
18-Foot V-Bottom Work-Boat

Shown herewith, are plans of an 18-foot, heavy work-boat, designed by P. W. Belcher, of San Francisco, for local use in operations contemplating rather severe service, including the handling of heavy chain, iron cable, anchors, etc.

Expense was not the primary consideration, though it was of course desired to keep the cost within reasonable limits. Strength and the ability to stand long and hard usage were the prime requisites, together with adaptability to use with a 4-h.p. detachable engine. In the latter consideration it has been attempted to draw the bilge line at stern in and up as far as permissible without sacrificing the essential buoyancy, in the attempt to allow a better flow of the water to propeller blades than is considered possible with the usual type of broad flat stern. The weight forward has been kept as high as possible, first to compensate in a measure for the weight of engine, and secondly through the probability that heavy weights (such as coils of wire rope, etc.) will be carried in after part of boat. The sheer line at bow has been flared out as far as was considered practicable in order to get the maximum amount of room on small deck for handling anchors, coils of manila line, etc., and without making her too blunt and stubby at water-line for ease of handling. The semi-V-bottom was selected in preference to flat bottom type on account of greater ease in handling, particularly in swift river currents, and estuaries where the tides are strong, and in the, at times, rough water of the upper San Pablo Bay and lower Sacramento River. It is thought that the power required to drive a boat of this type at a given speed will be considerably less than that required for a flat bottomed boat of the same dimensions, or in other words that more



18-Foot Work-Boat, Designed by P. W. Belcher

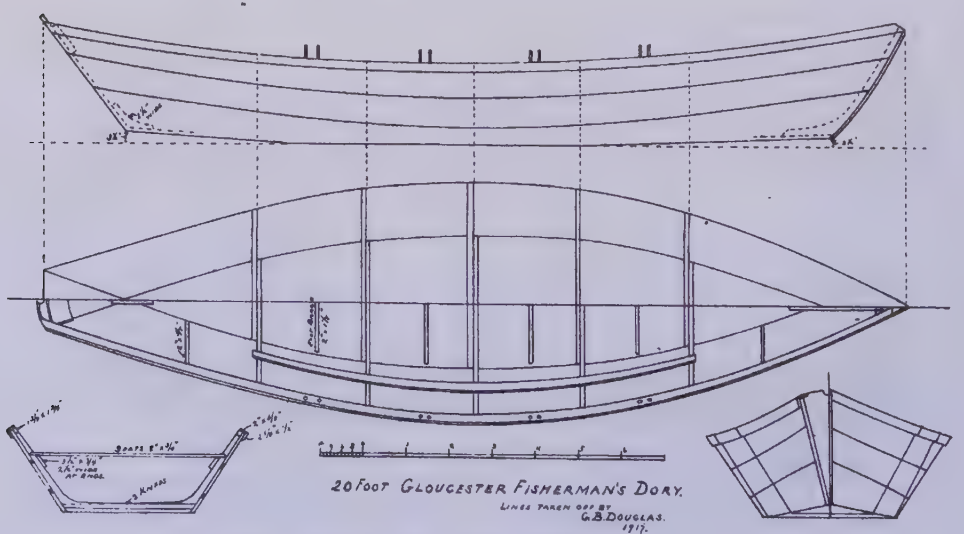


Construction Plan of 18-Foot Work-Boat

ground can be covered and more work done in a day with a given engine in this boat than in one with flat bottom of approximately the same size.

It is realized that the keel is, in comparison with frames, etc., pretty heavy and that the construction shown is somewhat unusual in calling for a solid piece in place of lighter or shallower keel with keelson worked over. The idea was to provide unusual strength and rigidity, and to do away as far as possible with fastenings which might in time and through hard usage work loose, and with joints, etc., for moisture to work in and cause rot not apparent on outer surface.

The type "D" boats are intended for particularly heavy work the gunwales being finished flush, armored with iron bands, and fitted with thole pins instead of row locks (the former being so much easier of renewal in case of loss or breakage, at points inaccessible to ship chandleries).



A Fisherman's Dory, 20 Ft. on Top, 16 Ft. 5 In. on Bottom, 5 Ft. 7½ In. Breadth

It is intended or proposed to bolt iron straps (U shape) to keel inside at about stations 4 and 15 for the purpose of lifting boat from the water. The suggestion has also been made to use chain plates, one on each side, at these stations worked outside of sheathing and inside fender, for lifting.

Fisherman's Dory

To the average yachtsman of today the dories with which he is familiar are modifications and improvements (?) of the original.

The lines of the 20-foot Gloucester fisherman's dory shown herewith were taken off by Geo. B. Douglas from the boats on a fisherman lying off South Brooklyn and the scantlings, etc., from boats at Fulton Market, New York.

This is the true dory as developed by the fishermen on the New England Coast. To the uninitiated they are cranky and not easy to handle, but to those familiar with the type they are as safe, seaworthy and as burdensome boats as can be found anywhere.

The mere fact that they are still used, without any modifications, in all the year round fishing should be sufficient proof of their worth.

The sailing dory of today and the dory skiff are wider on top, in some cases narrower on the bottom and the sides are rounded, the only link between them and the original being a narrow flat bottom, flaring sides and raking stem and transom.

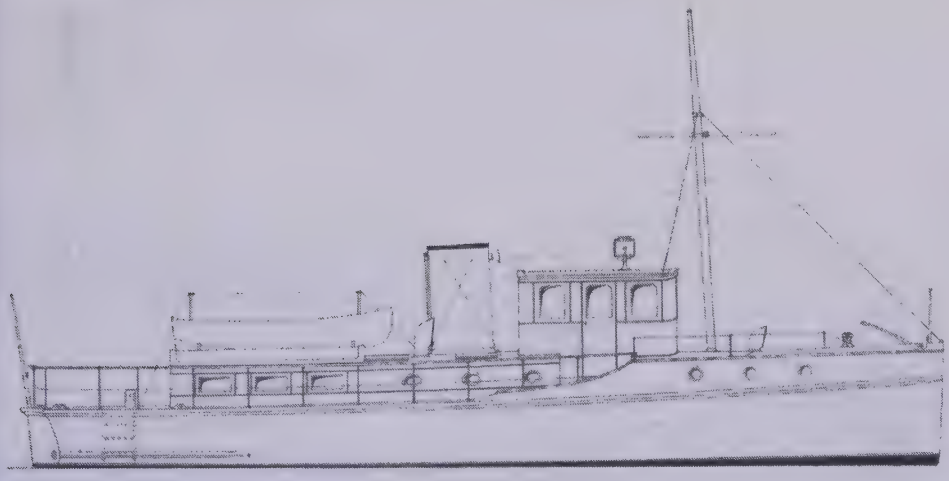
The seats in the fisherman dory are removable and when not in use are stowed one inside the other (nesting as it is called) on the deck of the large vessel.

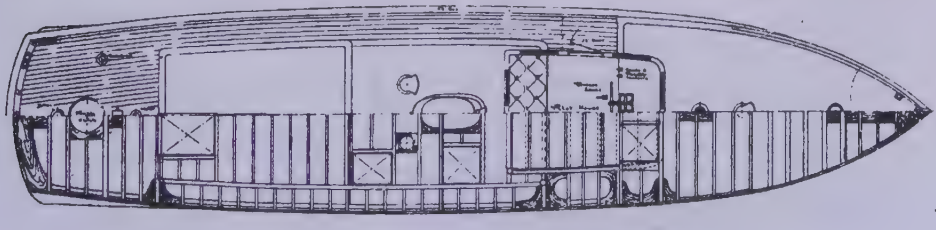
It is interesting to note that on some of the yachts that are being fitted out for scout patrols, the captains have requested that their regular heavy launches and boats be removed and that dories, sufficient to carry all the crew, be assigned to them. And in most cases this is being done and they will be nested on deck—fisherman style.

The one shown herewith is larger than will be used for this purpose but the characteristics are the same.

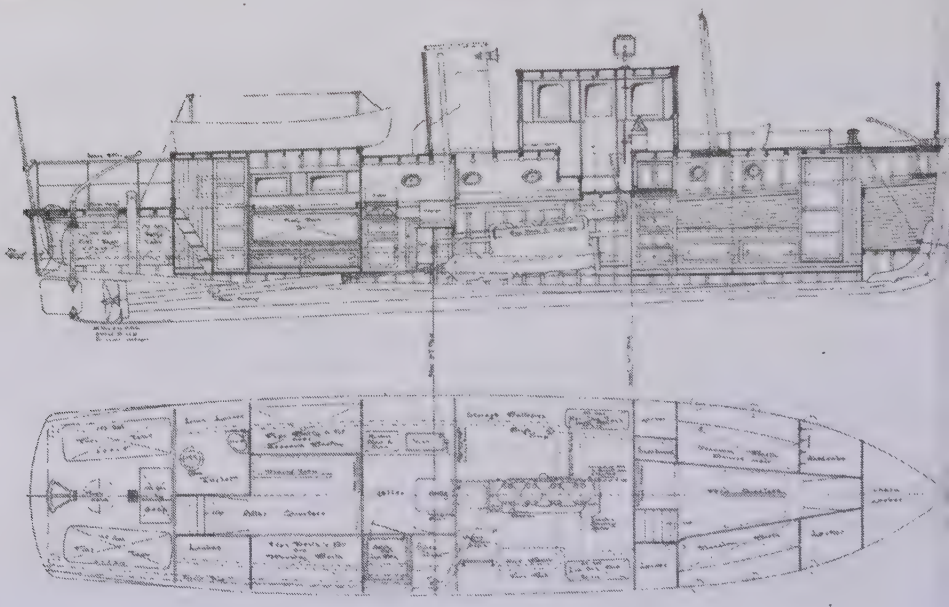
The principal dimensions are:

Length on top	20	feet	0	inches
Length on bottom	16	"	5	"
Width on top	5	"	7½	"
Width on bottom	3	"	1	"





50-Foot Patrol Boat, Designed by J. Murray Watts



Arrangement Plan of 50-Foot Coast Guard Patrol Boat

Coast Guard Patrol Boat

A 50-foot high-speed patrol boat is now being built by the Richardson Boat Company for the U. S. Government from plans furnished by J. Murray Watts. This boat is to be driven by an eight-cylinder, Model F 200-h.p. Sterling engine which is placed amidships and shut off from the rest of the boat by watertight steel bulkheads.

There is also an electric plant, storage batteries and switchboard for supplying the cabin lights, running and riding lights and searchlight. An unusual feature on so small a boat is the conning tower or pilothouse on the main deck. It has been found advisable to protect the helmsman, as the boat will be in almost constant use the year round. For this reason a good-size hot-water heating plant is also fitted to make the boat habitable in Winter.

The accommodations for the crew are very good for a boat of this size; the after quarters having two transom berths and two pipe berths; the forward quarters having two transom berths, and there is also an athwartship berth in the pilothouse. The arrangement plan shows a chain locker in the bow; then the forward quarters 12 feet long, with three lockers, a sideboard, wardrobe, two transom seats and a mess table, and steps leading up to the pilothouse. The engine room comes next with a length of 9 feet 6 inches, then the galley, 5 feet long, running the full width of the boat, about 11 feet at this point. The galley has a door opening into the after quarters, which are 10 feet long, with two transom berths, a dining table, large lockers, and a toilet room at the aft end. The boat is very strongly constructed throughou with 1¾-inch hard pine planking and heavy white oa keel and framing; all fastenings of copper or yello metal, and all equipment of the very highest class.

The general dimensions are:

Length	50 feet
Breadth	11 "

25-Foot Runabout

An attractive V-bottom runabout of unusually whol some, seaworthy lines, designed by Wm. H. Hand, J of New Bedford, Mass., is being built at Poughkeeps by George F. Buckhout. Lines developed from O Glory II and Old Glory III, also other similar boa built from Mr. Hand's plans, insure a highly satisfa tory boat for general purposes, one which will be fast a seaworthy.

The boat is attractively finished with mahogany trir mings. The power plant will be a four-cylinder, 4¾ 5½-inch Wisconsin engine, installed with full automobi control, including electric starting and lighting. A win shield which will drop into a pocket is a feature construction.

The general dimensions are:

Length o. a.	25 feet 0 inches
Breadth	5 " 11 "
Draught	2 " 2 "



25-Foot Runabout Building for George F. Buckhout

Winners of the Fishing Boat Competition

PART II

THE winner of the second prize in THE RUDDER competition for a fishing boat suitable for Florida waters was J. L. McKenzie, of Hamilton, Ontario. The plans are printed herewith.

Mr. McKenzie's design shows a boat well suited for the purpose. The cabin affords good protection for the engine and for stowage of fishing gear, etc.; the rig is sufficient for the work and with the auxiliary tiller, if the engine controls are carried aft, the fish can be handled entirely from the stern.

The specifications are so complete that we are giving them herewith:

All stock and materials shall be air-dried, free and clear from loose knots, shakes, checks, dry rot and other defects; no kiln-dried stock to be used.

All fastenings, unless otherwise specified, to be of best galvanized iron stock of the type usual in best construction.

Keel to be of white oak sided 3 inches, moulded as per plans, to be in one piece, same to be beveled for planking.

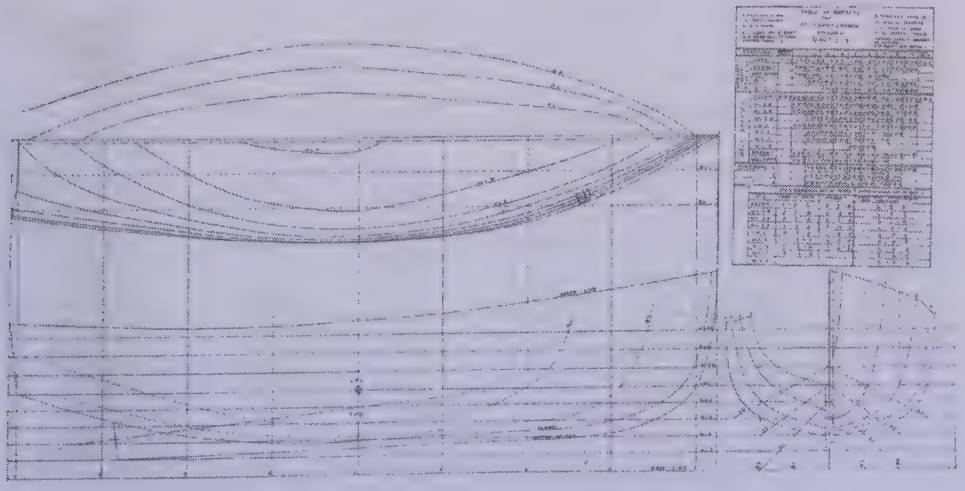
Stem to be of white oak sided 3 inches, shaped as per plans, to be rabbeted for planking, to be secured to keel by a stem knee sided 3 inches of white oak, shaped as per plans, and fastened to keel and stem by six galvanized iron bolts ½-inch diameter riveted over burrs. Face of stem to be beveled to a width of ¾ inch and bound with galvanized iron stem band with galvanized screws.

Horntimber to be of oak sided 3 inches, shaped as per plans, and secured to shaft log by six ½-inch diameter galvanized iron drift bolts.

Shaft Log to be of white oak sided 4 inches, shaped as per plans, and secured to keel with at least six ½-inch diameter bolts.

Stern Post to be of white oak sided 3 inches, moulded 3 inches and attached to horntimber by stern knee sided 3 inches, shaped as per plans, and secured to keel and transom with at least six ½-inch diameter galvanized bolts.

Transom to be of oak 1½-inch thick, shaped as shown, in as wide boards as possible, doweled together, seams caulked with cotton and payed with white lead putty and planed smooth, heads of fastenings in transom to be countersunk and covered with wood plugs.



Lines of Fishing Boat Designed by J. L. McKenzie

Floor Timbers to be of white oak 1¼-inch thick, moulded as per plans, each floor timber to be secured to keel with one ⅝-inch diameter galvanized bolt and to each frame with three galvanized iron wire nails.

Frames to be of best straight-grained white oak 1¼ by 1¼ inches, spaced 10 inches center to center, except in way of engine, where they are spaced 5 inches, each frame to be secured on top of keel with two long chisel point cut nails. Frames at bow and stern to be mortised into stem and horntimber, ends of frames and notch to be well red-leaded.

Sheer Clamp to be of yellow pine 2 by 3 inches, clamps to be fastened to each alternate frame by one ⅜-inch galvanized rivet and bow to 2-inch oak breasthook and at stern to 1½-inch oak quarter knees.

Bilge Clamp to be of yellow pine 2 by 3 inches, secured same as sheer clamp.

Planking to be of white cedar to finish ¾-inch thick in as long lengths as possible, no strake to have more than two butts, same to be midway between frames; there shall not be more than one butt in any frame space, each plank to be secured to each frame with two galvanized chisel point cut nails driven so the point cuts across the grain and clinched over on inside of frames; all heads of fastenings to be countersunk and filled with white lead putty.

Sheer Guard to be of oak 2 by 2 inches, beveled to face 1¼-inch and shod with 1¼-inch galvanized half-oval iron.

Deck Beams to be of oak sided 1 inch, moulded 1½ inches, spaced and crowned as per plans, to be sawn to shape, ends of beams to be mortised into clamp and fastened.

Deck Plank to be of yellow pine ¾ by 3 inches tongue-and-grooved, galvanized fastened from top and covered with 10-oz. canvas in one piece laid in thick lead paint and fastened with copper tacks, same to be covered with moulding.

Bulkheads to be of yellow pine ⅞ by 3-inch tongue-and-grooved staving.

Companionway doors to be of 1⅛ inch, stiles and rails with ⅝-inch panels, doors to be double hinged and fitted with brass lock and hinges, slide to be of 1¼-inch oak, shaped as shown.

Cockpit Floor Beams to be of oak sided 1¼ inch, moulded 1½ inch, ends of beams supported and fastened by riser, center of beams to be supported where necessary.

Cockpit Flooring to be of white pine ⅞-inch thick and screwed to floor beams, planks in center not to be permanently fastened, but to be cleated together to admit of access to bilge.

Ceiling sides of boat in way of cockpit to be sheathed with ¼ by 3-inch cypress, blind-nailed to frames.

Cabin Floor to be of ⅞-inch white pine, laid in 4 or 5-inch widths and screwed to floor beams.

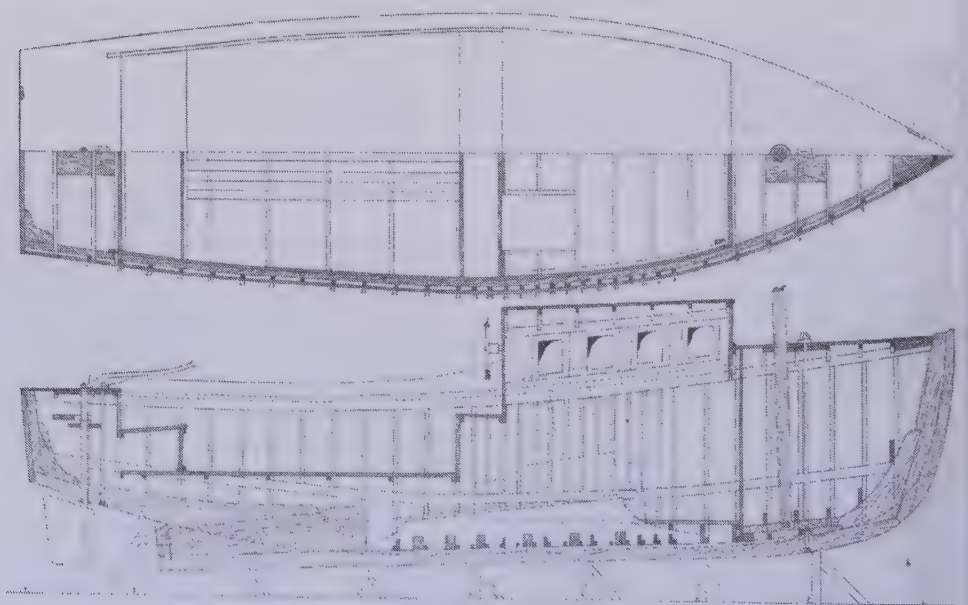
Companionway Steps: Sides to be of oak 1-inch thick, steps to be of oak ⅞-inch thick, to be fitted with chocks for feet, also brass hooks and eyes for top.

Steering Gear: Rudder blade to be of shape shown of ⅛-inch brass plate with 1¾-inch diameter bronze stock welded to blade and fastened to skeg with brass pintle. Rudder port to be of brass pipe to fit stock and threaded into horntimber and fitted with locknut on underside. Port to be passed through 1½-inch oak partner plank or brace. Rudder stock to extend through deck and to be squared for tiller. Rudder quadrant be be of 15-inch radius; steering line to be of ⅛-inch diameter galvanized flexible wire rope led over galvanized sheaves at least 3-inch diameter. Steering wheel to be of spoke type 20-inch diameter with maplewood handles.

Fuel Tanks: Under bridge deck, one on each side of engine, shall be installed a 15-gallon seamless steel tank to rest in spruce chocks and thoroughly strapped to prevent shifting, same to be fitted with 1½-inch filler plug.

Engine Bed to be of white oak entirely, made to suit dimensions of engine, bed logs to be of oak sided 4 inches, secured to foundation floor timbers by ½-inch diameter galvanized carriage bolts. Floor timbers to be sided 3 inches and as deep as possible.

Spars and Rigging: Mast to be of Oregon spruce fitted with ring at deck; mast to be 4-inch diameter at deck, 3-inch at shoulder and properly stayed with ⅛-inch galvanized wire rope fore and side stays, these to have turnbuckles set up in chain plates at deck, gaff and boom to be of spruce, as per plans; all



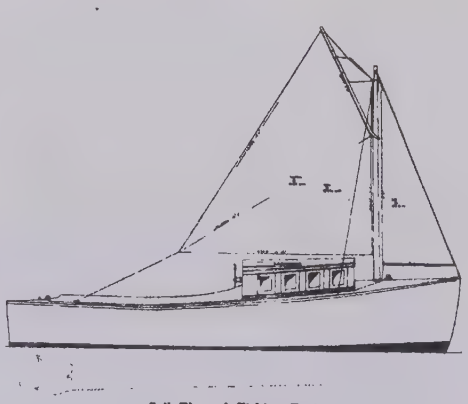
Construction Plans of Fishing Boat

running rigging to be manila rope. Sails of 10-oz. duck, of shape shown, to be provided with proper halyards and blocks.

Fittings: Two 6-inch chocks beveled; two 5-inch stern chocks; one mast deck ring 4 inches inside diameter; whistle outfit of owner's selection; steering wheel spoke type 20-inch diameter; 4-inch liquid compass in oak binnacle; 6-inch fog-bell; fire extinguisher; two copies of pilot rules; one fog-horn; set of sailing and anchor lights; two 3-inch cleats; life-preservers.

Painting and Finishing: Inside of planking to be given one coat of lead priming paint. Outside of hull to be given one coat of lead priming paint and above water-line three coats of best lead yacht paint of color desired by owner. Outside of hull below water-line to be given two coats of best copper paint of color desired by owner. Interior finish to be given two coats of interior varnish. Exterior natural finish to be given three coats of best spar varnish. Canvased decks to be given two coats of buff deck paint; all galvanized hardware to be given one coat of aluminum paint. All tanks to be red-leaded and painted as desired.

The several designs submitted in this competition were all very interesting and the judges, Messrs. Gielow and Mallory, had some trouble determining which were entitled to the prizes and the order in which they should be placed. Next month THE RUDDER will publish winners in other competitions together with some plans.



Sail Plan of Fishing Boat

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART VI

MY explanations up to this have been for the purpose of explaining a few of the fundamental laws of flotation and methods of making calculations. I will now pass to actual designing work and explain how the shape for a hull is determined, and the reasons for shaping it in the selected manner; and having done this I will try and help you to acquire designing ability, or to improve the designing ability you possess. For you must always bear in mind that designing is an *art* and being such the successful designer must possess the ability to *originate* and to actually picture in his mind the form and details of the boat he intends to design.

Anyone can learn how to make the calculations a naval architect makes when he desires to prove the accuracy of his designs, but to actually design a boat is an entirely different matter and calls for a knowledge of the laws of resistance to progress through water, of the forces a boat has to overcome and to resist, of construction and equipment, and of the relative value of certain shapes, or forms, for boats of various types.

It does not follow that because a man has a most thorough knowledge of calculations, and of shapes and forms of boats he will be a successful designer, because designing cannot be learned from books; the most books can do is to help develop designing ability.

No one can become a successful designer unless he possesses designing ability and cultivates it by continually practicing; and bear in mind that the practice work should always be along definite lines. To drift from one designing idea to another without reason and with only a hope that you will produce a design that is better than any other cannot lead to success and is more likely than not to lead to failure. There are two ways in which a designer can set about his work; he may either take the design of some boat prepared by him in the past and working from it and data obtained from boat's performance he can try and improve the design, or he can prepare an entirely new design. An architect usually works from a previously prepared design because by doing so he simplifies work, shortens labor, and obtains more definite results. On the other hand a young man just starting to prepare designs is not likely to have very much data to work from and often finds it necessary to prepare an entirely new design with only a few published items taken from other designers' work to help him.

In this case I will assume that it is necessary to prepare an entirely new design and that the only data to guide you is that given on Table No. 1 of this Part. The data given on table happens to be taken from a design of a boat of somewhat similar type and dimensions to the one selected for the design that will be prepared.

The work of preparing a design can be said to consist of two distinct parts:

1st.—The preliminary work. Done for the purpose of obtaining data and shortening actual designing labor.

2d.—The actual designing work, calculations, preparation of drawings, specifications, etc.

EXPLAINING PRELIMINARY WORK

This is solely for the purpose of shortening the final designing labor and it is really wonderful how much of a help, in this respect, a little preliminary work is.

In this particular instance the particulars given by client are sufficient to enable a designer to begin work, but in cases where such details as breadth, draught, speed, etc., are left entirely to the designer's judgment it becomes necessary to decide these details, and in fact the selection of dimensions can be called the first preliminary work.

No fixed rules can be laid down to guide a designer when he has to decide details of this kind. Knowledge acquired through observation of similar boats designed by well-known men is perhaps the best guide, it being generally safe to accept dimensions used by experienced designers as being good practice, or at least sufficiently accurate to use when making preliminary calculations.

Preliminary calculations are for the purpose of approximately determining these things:

1st.—Dimensions and kinds of materials to use and displacement necessary.

2d.—Area, shape, and location of Midship section.

3d.—Area, shape and location of L.W.L.

4th.—The M.I. of L.W.L. and probable transverse M.C. height.

5th.—The freeboard necessary.

6th.—The H.P. necessary for speed named.

7th.—The following coefficients: Prismatic, Displacement, Midship section, L.W.L. plane.

1st.—Dimensions of Material to Use and Displacement Necessary.—To calculate dimensions of materials necessary for parts of a hull is unnecessary because strength of materials of kinds used in boat construction has been calculated many times and in addition to this a number of tables of standardized material dimensions to use for various sized power-boat hulls have been compiled, and from such tables a designer can quickly select the proper dimensions and kinds of materials to use.

Table No. 2 is a copy of one of these timber tables, and Table No. 3 (page 429) gives fastening dimensions.

Explanation of Table No. 2

This table is for the purpose of helping you determine dimensions of material to use for the principal parts of a wood-constructed boat, or yacht.

TABLE No. 1

PRELIMINARY DATA SHEET

Type of Boat—Cabin Cruiser

DIMENSIONS	Length over all	36.00 ft.	On L.W.L.	34.00 ft.
	Breadth extreme	9.16 ft.	On L.W.L.	8.25 ft.
	Draught extreme	3.08 ft.	To Rabbet	1.83 ft.
	Mean Draught	1.185 ft.		
	Least Freeboard	2.33 ft.	Greatest Fbd	5.62 ft.
	Overhang Bow	0.79 ft.	Overhang aft	1.29 ft.

Data

Particulars	Weight Lbs.	Volume Cu. Ft.	Area in Sq. Ft.	Distance in Feet	Coeff.
Displacement required.	12526	195.72	....	....	....
Block Coeff. of Displacement	....	....	....	....	0.589
Prismatic Coefficient	....	....	....	....	0.609
Midship section area	....	....	9.44	....	....
Midship sec. coefficient	....	....	....	....	0.625
L.W.L. plane area	....	....	194.50	....	....
L.W.L. plane coefficient	....	....	....	....	0.739
Midship section from No. 1	....	....	....	19.00	....
M. of I. of L.W.L. plane	....	....	....	....	816.80
C.B. from No. 1 ordinate	....	....	....	18.71	....
C.B. below L.W.L. plane	....	....	....	0.532	....
C.G. from No. 1 ordinate	....	....	....	18.72	....
C.G. above the L.W.L.	....	....	....	1.01	....
C.G. of L.W.L. plane from No. 1	....	....	....	19.21	....
C.L.R. from No. 1	....	....	....	19.18	....
M.C. above C.B.	....	....	....	4 1	....
*M.C. height above C.G.	....	....	....	2 558	....

The table gives *two* dimensions of each principal part of construction for boats of named dimensions, the named dimensions being:

L—Standing for length on deck.

B—Standing for extreme breadth.

D—Standing for depth inside from top of keel to sheer at midship section position.

If boat is a *raised cabin* cruiser the point of measurement is top of hull sheer *without the raised cabin*, and to

TABLE No. 2

Dimensions of Timber for Cruisers

Dimensions L x B x D	20′ x 6′ x 3′	25′ x 7′ x 4′	30′ x 8′ x 5 5′	35′ x 9′ x 6′	40′ x 10′ x 6.5′	45′ x 11′ x 6.5′	50′ x 12′ x 6 75′	55′ x 14′ x 7′	60′ x 15′ x 7.5′	70′ x 16′ x 8′	80′ x 18′ x 9′	90′ x 20′ x 10′
Sided and Moulded	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.	S. M.
Keel	2½-4	2¾-6	2¾-7	3¼-6	3¾-8	3¾-8	3¾-9	4¾-11	4¾-9	5¾-9	5¾-10	5¾-12
Keelson	0	0	0	0	2-4	2-6	2-8	3-6	3-6	3-6	3-8	3-9
Stem	2½-8	2¾-9	2¾-9	3¼-9	3¾-10	3¾-11	3¾-12	3¾-13	4¾-15	5¾-12	5¾-14	5¾-15
Stern Post—Log	3¾	3¾	3¾	3¾	4¾	5¾	5¾	6¾	7¾	8¾	8¾	8¾
Deadwood	2½	2¾	2¾	3¾	3¾	3¾	3¾	3¾	4¾	5¾	5¾	5¾
Ribs (Bent)	⅞-⅞	⅞-1⅛	1⅛-1¼	1⅛-1⅜	1⅛-1¾	1¾-1⅞	1⅞-2	1⅞-2¼	2¼-2½	2¼-3	2½-3	2⅞-3
Spacing	8	8	9	9	10	11	12	12	12	12	12	12
Floor Timbers	⅞-3	⅞-3	1⅛-3	1⅛-4	1¾-4	1¾-4	1¾-6	1⅞-6	1⅞-6	2¼-6	2¾-6	2⅞-6
Deck Beams	⅞-1½	⅞-1½	⅞-1¾	1⅛-2	1⅜-2¼	1⅝-2¼	1¾-3	1¾-4	1¾-5	1⅞-5	1⅞-6	1⅞-6
Clamps—Deck	⅞-3	⅞-3	1⅛-4	1⅛-4	1⅜-4	1⅜-5	1⅞-6	2¼-6	2¼-6	3¼-6	3¼-7	3¼-8
Planking	¼	⅛	⅛	⅛	⅛	1⅛	1⅛	1⅛	1⅛	1⅜	1¾	1⅞
Covering Board	¾	¾	⅛	⅛	⅛	1⅛	1⅛	1⅛	1⅛	1⅜	1¾	1⅞
Decking	¾	¾	⅛	⅛	⅛	1⅛	1⅛	1⅛	1⅛	1⅜	1¾	1⅞
Flooring	¾	¾	¾	¾	⅛	⅛	⅛	⅛	⅛	1⅛	1¾	1⅞
Bulkhead (Wt.)	⅛	⅛	⅛	⅛	1⅛	1⅛	1¾	1⅝	1⅞	1⅞	2⅛	2⅛
Engine Bed	2¾	2¾-12	2¾-12	3¾-12	3¾-12	3¾-12	3¾-12	4¾-12	4¾-12	5¾-12	5¾-12	5¾-12
Length	10	12-5	14	15	16	18	20	22	25	28	30	35
Clamps (Bilge)	0	⅛-3	1⅛-3	1⅛-3	1⅜-3	1⅝-4	1⅞-4	2¼-4	2¾-4	3¼-5	3¾-6	3¾-6
Bilge Clamps No. of Pairs	.....	.....	1	1	1	1	1	2	2	2	2	2

this measure must be added the proportion of raised cabin height mentioned below, *viz.:* If raised cabin extends over less than one-half the length of boat add to depth measured as above ¼ the raised cabin depth. If raised cabin length is over one-half and less than three-fourths of boat's length add ½ of its depth, and if length is over three-fourths of the boat's length add ¾ of the raised cabin depth.

TABLE No. 3

SIZES OF FASTENINGS FOR CRUISERS

Dimensions	20 x6	25 x7	30 x8	35 x9	40 x10	45 x11	50 x12	55 x14	60 x15	70 x16	80 x18	90 x20
Keel-Stem-Stern, ... Bolts or Riveted.....	⅜	⅜	⅜	½	½	⅝	⅝	⅝	¾	¾	⅞	⅞
Deadwood, etc, Driven at Angle.....	⅜	⅜	⅜	½	½	⅝	⅝	⅝	¾	¾	⅞	⅞
Shaft Log,.....	⅜	⅜	⅜	½	½	⅝	⅝	⅝	¾	¾	⅞	⅞
Side Fastenings.....	¼	5/16	5/16	⅜	⅜	½	½	½	⅝	⅝	⅝	⅝
Engine Bed.....	⅜	⅜	⅜	½	½	½	⅝	⅝	¾	¾	¾	⅞
Bolts.....	⅜	⅜	⅜	⅜	⅜	½	½	⅝	⅝	¾	¾	¾
Keelson, Driven at Angle.....	X	X	X	X	½	⅝	⅝	⅝	¾	¾	⅞	⅞
Floor Timbers, Driven in Keel.....	¼	¼	5/16	⅜	⅜	⅞	½	½	½	⅝	⅝	¾
Clamps, Bolts or Rivets.....	¼	5/16	5/16	⅜	⅜	⅞	½	½	½	⅝	⅝	¾

At the beginning of each line the name of part is entered, and at the head of each column is entered dimensions as explained above. Immediately below the dimensions heading you will find the letters, S. M.; these stand for *sided* and *moulded,* and indicate the way the material is to be placed in boat.

As it is most important to fully understand this I will explain it in detail. The letters S and M indicate to builder the way each piece of material is placed in boat. S means *sided* and indicates that size, or dimension, entered under this letter must stand in a position contrariways to the moulded position. M means *moulded* and tells builder that dimensions entered under this heading must be placed the way *mould,* or pattern, is laid on timber when marking the shape out. For instance, the keel and stem patterns, or moulds, are always made to lie on the side of keel and stem as set up in boat, therefore the M dimension of keel and stem is depth of keel from top to bottom, and depth of stem from front to back. When referring to a rib, or frame, M dimension indicates measure from inside of planking to inside rib as it sets in boat, or the way *mould* would lay on bent, or sawed out, rib or frame.

A study of the parts of a boat will enable you to grasp the meaning of the terms S and M.

If, however, you desire to calculate dimensions of materials to use for the construction of any sized power boat, use the formulas given in "How to Run a Boat Shop," a little book just published by THE RUDDER. The formulas given in that book are clearly explained and so simple that anyone can accurately determine the proper dimensions of materials to use by making a few short calculations.

KINDS OF MATERIALS TO USE

Explanation of Table No. 4.—This table gives relative value of various kinds of woods used in boat and ship-building. The list is compiled from tables used by insurance companies and boatbuilders, and in accordance with present-day practice in U. S. A. Under heading *name of timber* the names of principal kinds of woods are entered.

Above the other columns are entered, in succession, the name of principal parts of boats and vessels, and under each heading you will find numerals entered. These numerals indicate relative value of each kind of wood for part named at head of column. The figure 1 standing for first choice, or best wood for the purpose, 1½ standing for next best, and so on. Thus if you desire to select best kinds of materials the selection should be made from those having 1 entered against them. Pay particular attention to the reference, etc., entered in some of the columns.

TABLE No. 4—KINDS OF MATERIALS

Name of Timber and Fastening	Keel	Stem and Stern	Deadwood	Floor Timbers	Ribs (Bent)	Frame (Sawed)	Clamps	Deck Frame	Knees	Garboard	Planking	Sheer Strake	Decking	Covering Board	Keelsons	Engine Bed	Coamings Open	House Coamings	Joiner Work	Fixed Bulkheads	Remarks
Best White Oak.....	1	1	1	1	1	1	1	1	1	*1	*1	1	1½	1	1	1	0	1	1	1	*For over 1¼".
Common White Oak..	2	2	2	1½	1½	1½	1½	1½	1	*1½	*1½	1½	1½	1	1	1	1	1½	0	1½	†For under 1¼",
Red Oak.....	4	3	3	3	2	2	2	2	2	*3	*3	2	1½	3	2	2	2	2	2	2	‡For over ⅝".
White Cedar.....	0	0	0	0	0	0	0	0	0	†1	†1	1½	0	4	0	0	0	0	0	X1	R—Riveted.
Chestnut.....	0	3	2	2	0	2	2	2	0	3	3	0	0	0	0	2	0	2	2	2	X For under ⅜".
Hackmatack (knees).	0	1	0	1	2	1½	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
YellowPine(LongLeaf)	2	3	1	3	0	0	1	3	0	‡1	‡1	1	1	2	1	1½	0	1	2	1½	
Red Pine.....	0	0	2	0	0	0	2	3	0	‡2	‡2	2	2	2	2	2	0	1½	2	1½	
Pine (Oregon).....	3	3	1	0	0	0	1	3	0	‡2	‡2	2	1½	2	2	2	0	1½	2	1½	
Pine (White).....	0	0	0	0	0	0	2	0	0	‡1	‡1	1½	1	3	3	3	0	1½	1	X1	
Spruce First Quality..	0	0	0	0	0	0	2	3	0	0	0	0	0	3	0	3	0	1½	2	1½	
Common Spruce.....	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	2	0	2	
Rock Elm.....	1	2	2	2	1	2	0	2	0	0	0	0	0	0	2	0	0	0	0	0	
Cypress (Red).....	0	0	0	0	0	0	3	0	0	†1	†1	1½	1½	2	0	0	0	2	2	X1	
Cypress (Yellow).....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mahogany.....	0	0	0	0	0	0	0	0	0	2	†1	†1	1	1	0	0	*1	*1	1	1	
Copper.....	1R	1R	1R	1R	1R	1R	1R	1R	1R	1R	1R	1R	0	0	1R	1R	0	0	0	0	
Bronze.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gal. Iron.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	

(To be Continued)

New Rochelle Yachtsmen Organize Police Patrol

NEW ROCHELLE is well named Queen City of Long Island Sound; only 17 miles from Forty-second Street, New York City, made famous by the Huguenots in its early days and later by George Cohan in his play, "Forty-five Minutes from Broadway." It is the first city on the waterfront beyond New York on Long Island Sound and is an ideal location for yachtsmen.

The city proper covers 10 square miles of territory and is policed by a force of fifty men in normal times. When war was declared by the United States the Sheriff of Westchester County inquired of Mayor Griffin what means he had at his disposal for local protection. The Mayor called for volunteers and over five hundred and fifty men responded to the first call and are now on active duty. This gave the town proper ample police protection, but entirely neglected the harbors and outlying islands.

Commodore Vigouroux, of the Huguenot Y. C., proposed organizing the yachtsmen to protect the waterfront. His proposal was accepted and the New Rochelle Harbors Police Patrol was organized. The organization is composed of three clubs, New Rochelle Y. C., Huguenot Y. C., New York Athletic Club, and the Huguenot Power Squadron. A meeting of the officers of the yacht clubs and power squadron was called. Commodore Vigouroux modestly insisted the retiring commodore of the Huguenot Y. C. accept the office as commander and the following officers were elected: H. M. Williams, commander; George C. Bell, lieutenant-commander; Chas. A. Marsland, lieutenant-commander; Geo. E. Vigouroux, first lieutenant; H. M. Betts, first lieutenant; Harry Anderson, second lieutenant; H. H. Moulton, second lieutenant; Edwin H. Tucker, adjutant, 220 Broadway, New York City, telephone Cortlandt 7398.

The officers of the Huguenot Y. C. were hopeful the object of the organization would interest the members and the result of the first meeting was very gratifying. Practically the whole club volunteered—in fact, so many offered their services for active duty it was necessary to establish a waiting list.

Commodore C. A. Marsland, of the New Rochelle Y. C., reported a similar response and the members of the New York Athletic Club, under Commodore Anderson, responded in large numbers.

The officers worked out the plans so thoroughly that within two days active work started. Every night a patrol boat is stationed in Echo Bay, manned by members of the New Rochelle Y. C. At the lower harbor a patrol boat of the Huguenot Y. C. or the New York Athletic Club takes up a station. The boats reach their station at 8 p. m. and remain until 5 a. m.

From the station boats men are sent out in small boats and patrol the shore, docks and parks. Small launches make trips outside and a constant patrol is maintained throughout the night.

The yachtsmen under the guidance of the officers have been well organized and the Police Commissioners were so satisfied with the organization they turned all the waterfront property and parks over to the New Rochelle Harbors Police Patrol, which is the only organization in New Rochelle that has been given complete charge by the authorities. The work of the New Rochelle yachtsmen is invaluable for home protection and Commodore Williams will be pleased to assist yachtsmen in other localities who desire to form similar patrols on our seacoast, river or lake ports.



Marilene II, H. M. Williams, Commander New Rochelle Harbors Police Patrol

Work Women Can Do to Help

THE United States of America is only nominally in the war at present. Its fighting men have not taken part in any action but some of the merchant ships owned by citizens of this country have been sunk by submarines and some lives have been lost. But in a short time the American Army will be fighting in France or on some other frontier and the Navy will be helping in the blockade and the ships will be fighting.

Already many kindly disposed are asking what can be done to militate the sufferings of those who are to bear the burdens of the battles. The Red Cross is actively at work and women in all parts of the country are taking part in this work. The Red Cross has already done much to help in the war but in the future with the men of this country on the fighting lines it will have much more to do.

Several inquiries have been made at THE RUDDER office about such work and various small organizations of women have wondered how they can help. Some have suggested that they might make comfort bags for the sailors of our Navy or might knit socks for the sailors either of the fleet or of the Reserve.

Naval officers, however, rather discourage this work. In a large measure it is thought to be unnecessary because the sailor is well cared for. Conditions at sea are not what they were years ago. The huge fighting vessels have comforts on board that were never dreamed of in the old days and Jack is just as happy and as comfortable at sea as he is at home, and often more so.

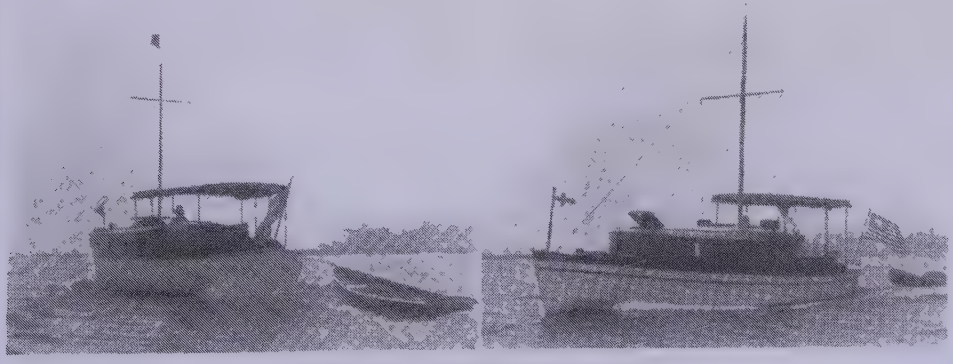
The late Captain John Randolph Hamilton, who graduated at Annapolis at the class of 1845, used to say, when asked which arm of the service one should join, "Join the Navy, for you will always be sure of having a roof over your head and a bath."

The sailors have their troubles particularly when in battle, but at the worst their troubles do not compare with those of the men of the Army who are in the trenches. The sailors have warm, dry ships to live on, they have good warm outfits furnished by the Government, and as compared with the soldier are infinitely better off.

The soldier needs comforts. Warm socks are luxuries, and the comfort kits which were made in large quantities and sent to the French soldiers were greatly appreciated by those who received them. Some funny incidents have occurred. In purchasing the necessaries for these kits, such as scissors, tooth-brushes, etc., some worthy ladies did not notice that these articles were marked "Made in Germany," and they are said to have rather rubbed the sensitive natures of the recipients, particularly when they have been French.

Just now perhaps the most worthy of all the work that is being done is for the Belgians and French of Northern France. Hundreds of thousands of children and women are absolutely destitute in Belgium and in that part of France which has been devastated by the war. Little children left orphans are dependent on the help that they receive from many women who are working for their support and to men who are subscribing liberally to funds to purchase food and keep them from starving. It was for this purpose that "Papa" Joffre, Marshal of France, was presented with a large check while visiting New York, and no more worthy charitable work can be undertaken than to help to furnish food and clothes for these children.

It must not be forgotten that the soldiers and sailors must have some entertainment. They cannot be fighting or drilling all the time. The British arrange all sorts of entertainments for their men even while they are on the fighting front. They may be in the trenches one day and the next taking part in a football match or some other game. This keeps them from worrying too much and takes their minds off the hard work and tragedies occurring all the time. They are also kept well supplied with reading matter. Now if each one left at home will undertake to send reading matter in the shape of magazines or newspapers to some one in the service, a good work will be done which will be highly appreciated by those who receive such reading matter.



Station Boats of New Rochelle Harbors Police Patrol

Alidor, Geo. C. Bell, Lieut.-Commander, N. R. H. P. P. Antram, T. L. Coe, Ensign, N. R. H. P. P.

New Jersey Yachtsmen Will Race

By J. Kinzer Shell, Jr.

EVEN though preparations are being made by the officers of the Naval Coast Defense Reserve for defending the Atlantic coast-line from Bay Head to Cape May and the Delaware River and Bay, and the need of power boats of the cruiser type and yachtsmen to man the reserve fleet, the yachtsmen of the four organizations which direct the water-sports on the Jersey Coast and Delaware River and its tributaries, have decided to hold the events which have been scheduled. The officials who are in charge of the big schedule of events for sailboats and power boats have studied the effect the preparations for war will have upon the racing and have decided to race.

The action of the South Jersey Y. R. A. and the Delaware River Yachtsmen's League in deciding to carry out the schedule arranged, with slight modifications, when the necessity arises, shows that even with the enormous preparations and the interest being displayed by the yachtsmen of the hundred or more clubs in the three sections, there will be no lack of interest in the racing game.

The events with the features added which are contemplated will be more exciting than heretofore, not alone to the spectators but to the participants themselves. Even though the members of the regatta committee of the Delaware River Y. R. A. were given power to cancel the sanctioned events, the men who have the racing in charge are making arrangements to revise the events and hold them over new courses, which while not up to the requirements, will satisfy the yachtsmen and keep them interested in the game, which is the primary object in holding the races under present conditions.

The arrangements being made by the Naval Reserve and the restrictions placed upon traffic of pleasure boats has necessitated the holding of the cruising races over courses where the safety of the boat and the crew is assured. Some of the cruiser races call for at the present time courses over mine districts, past forts, steel nets and travel at night. No permission will be granted for races to be held over such restricted areas. No boats, either pleasure or craft used for other purposes, are allowed to lift anchor after sunset or before sunrise.

With but one event being dropped from the racing schedules, the events, as a whole, which will be held this Summer, will be better and bigger than in former years. All told, there will be seventy-six races for all types of power boats. The sailboat will outnumber the power boat in the number of events to be held, eighty-four being arranged for.

The Delaware River Yachtsmen's League made a good move toward keeping the interest alive by opening their events to all boats belonging to members holding membership in clubs affiliated with the A. P. B. A. In a manner the opening of the racing events will go a long way toward the mending of the break which occurred between the clubs making up the League and the Delaware River Association three years ago, due to a slight misunderstanding.

The leading racing will be held for the power boats on the Delaware River, although the other two sections will have their share. The Delaware River Yachtsmen's League has scheduled four port-to-port race-meets while the Delaware River Y. R. A. is going ahead on its schedule of events, which include such cruiser contests as the Overfall's Race of the Yachtsmen's Club, the du Pont Trophy contest, the Ship John event, and the annual championship cruiser race of the Delaware.

The South Jersey Association will hold its five race-meets under the joint auspices of the nine clubs over the inland waterways. The only event which cannot be held unless a change is made is the third annual contest for the Coxe-Hall Cup, which has been scheduled to be held under the auspices of the Corinthian Y. C. of Cape May on Saturday, August 4th, over a course of 51½ miles, of which 48 miles is at sea.

What will make the racing among the South Jersey folks interesting will be the participation of the men who are preparing for Naval Reserve service and have devoted some little time to the study of navigation, in being aboard the several competing boats. The nine clubs of the association have made arrangements when the season is gotten underway to start classes for instructing the members in every phase of navigation and the required needs of the men in the different capacities in the Reserve. Such activity has been occurring at the clubs on the Delaware River. The Barnegat Bay folks also are interesting themselves in getting down the finer points of navigation and the handling of a boat.

The season will open on Saturday, June 9th, when the substitute race for the Overfall's contest of the Yachtsmen's Club will be held from Essington to Burlington Island. Every Saturday, from then on until the third week-end of September, there will be a racing event of some sort. The sailboat contests will intermingle with the power-boat events and the two types of events will be held jointly as well as separately. Championship titles will be at stake and despite the interest displayed in Naval preparation there will be plenty of competition this Summer.



Yachting Will Not Be Stopped

THE war is not going to put a stop to all yachting. Many yachts will be in commission and used by their owners off the coast and on inland waters. Some of these are already in commission. Of course many of the steam yachts and the larger power yachts are enrolled in the Naval Coast Defense fleet and of these some are in commission doing patrol work, while others are being fitted for the work by way of strengthening. The owners and crews of these boats also enrolled in the Reserve will do their yachting this year in a more serious manner. They will have experiences that will long be remembered and their early yachting training will stand them in good stead.

Those owners whose yachts have not been accepted are to fit them out and get some fun as usual during the Summer months, but on account of the restrictions placed by the Government in the closing of harbors their cruising will necessarily be limited. Even with the closing of the harbors at certain hours each day there will still be lots of room left for racing and cruising. Long Island Sound is to be closed each evening at the Fishers Island end and at Execution Rock, but between those two points there is a length of water which should be plenty for any owner of a small yacht. His cruising is not to be limited, however, to that expanse but he must do his entering or leaving the Sound while the channels are opened.

The Long Island Sound Y. R. A. has arranged a schedule of races. This, however, may not be followed strictly. Each club has the privilege of calling its regatta off as the time set approaches and it is possible that no championship series will be sailed this season, but there will be lots of regattas held by clubs for their members and very probably open regattas will also be sailed during the Summer if there are sufficient owners who are anxious to sail races.

The Seawanhaka-Corinthian Y. C. has announced a few closed races for yachts owned in the club and these will be mostly for the challenged trophies sailed for each season.

In addition to these some open events may be named later. It is very probable, too, that the Larchmont, Indian Harbor and other clubs will have races for their special classes.

On Gravesend Bay the Association has not arranged a championship schedule but it is understood that the clubs will arrange for regattas, and the classes of yachts to take part in these events will depend on what boats are in commission.

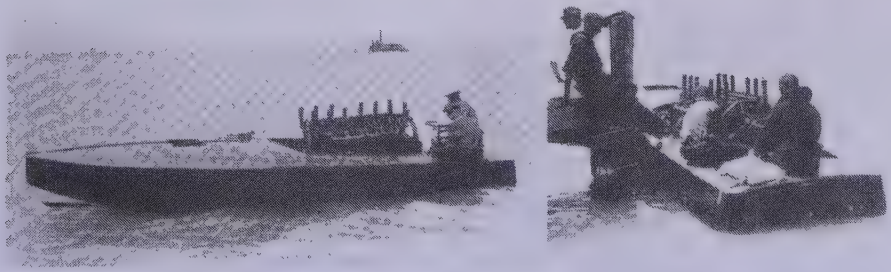
In Eastern waters no schedules have been arranged but the many clubs are arranging for club regattas and there will be open events.

The New Jersey and Philadelphia yachtsmen have arranged schedules and there will be lots of racing at Barnegat, on the Delaware, and off the Southern New Jersey Coast unless something unforeseen should necessitate the abandonment of the plans now made.

The American Power-Boat Association through its racing commission has sanctioned many events throughout the country. The New York-to-Albany and return race is set for June 30th. The Block Island races of the New York Athletic Club are set for June 23d. The series of races for the Thousand Island Y. C. Cup and for the championship of the St. Lawrence River will be held on Alexandria Bay on August 8th, 9th and 10th. The races for the Gold Challenge Cup of the American P. B. A. will take place late in August, no matter what happens. This trophy is now held at Minneapolis, but whether the races will be held on Lake Minnetonka or over some Eastern waters has not yet been decided.

The Mississippi Valley Power-Boat Association's regatta will be held at Minneapolis on July 3d, 4th and 5th, as originally scheduled. The business interests of Minneapolis regard this regatta as a matter of preparedness which should not be dispensed with even though the war is in progress. The regatta will be made a patriotic affair and it is expected that Government officials will help to make it a success.

Activities of the United States Power Squadrons have received new impetus through the war, and many new men are being enrolled and instructed in this organization. The squadrons have been instrumental in inspiring nearly a thousand men to serve their country in the Naval Coast Defense Reserve, and one of the most important duties which this organization has set for itself during the coming season is that of giving inexperienced men practical instruction aboard the power boats of the members.



Miss Miami, a One-Step Hydroplane, Owned by Glen H. Curtiss, and Driven by a Curtiss Engine. Speed 66 M. P. H.

Yachts Building for 1917

PART III

STEAM

Name of Yacht	Owner	L. O. A. Ft.	L. O. A. In.	B. Ft.	B. In.	D. Ft.	D. In.	Designer	Builder	Engine, Maker	No.	H.P.
... .	Robert E. Tod.....	110	0	15	0	4	6	Herreshoff Co.....	Herreshoff Co.....	.....	(2)	1200
....	A. E. DuPont.....	110	0	15	0	4	6	Herreshoff Co.....	Herreshoff Co.....	.....	(2)	1200
.....	Payne Whitney.....	110	0	15	0	4	6	Herreshoff Co.....	Herreshoff Co.....	.....	(2)	1200
.....	H. S. Vanderbilt...	110	0	15	0	4	6	Herreshoff Co.....	Herreshoff Co.....	.....	(2)	1200

GAS AND DIESEL ENGINES

.....	Max Fleischmann..	144	7	20	0	7	6	Gielow & Orr.....	Kyle & Purdy.....	Winton-Di'sl	(2)	600
Kiva.....	F. L. Humphreys..	87	0	17	0	4	8	J. M. Watts.....	Smith & Williams Co.....	Sterling	(2)	140
Gretchen.....	Albert Pach	76	0	13	0	4	6	Great Lakes B. Cor.....	Great Lakes B. Cor	Duesenberg	(2)	400
Anado.....	J. A. Mollenhauer..	70	0	13	0	3	0	Gas Engine & Power Co...	Gas Engine & Power Co...	Speedway	(2)	350
.....	E. E. Dickinson...	66	0	11	6	3	9	Gielow & Orr.....	.....	Van Blerck	(2)	160
.....	P. G. Thomson....	60	0	10	6	3	6	Matthews B. Co.....	Matthews Boat Co.....	Sterling	(2)	350
.....	W. M. Chesebrough	55	0	12	0	3	1	Gas Engine & Power Co..	Gas Engine & Power Co...	Speedway	(1)	130
.....	.....	52	0	11	4	3	0	Gas Engine & Power Co..	Gas Engine & Power Co...	Speedway	(1)	130
.....	C. L. Bausher.....	52	0	11	4	3	0	Gas Engine & Power Co..	Gas Engine & Power Co...	Speedway	(2)	260
Sunbeam III..	C. L. Bauscher....	52	0	11	4	3	0	Gas Engine & Power Co...	Gas Engine & Power Co...	Speedway	(2)	260
....?	.....	52	0	11	4	3	0	Gas Engine & Power Co...	Gas Engine & Power Co...	Speedway	(1)	130
.....	.....	50	0	8	6	2	1	Gas Engine & Power Co...	Gas Engine & Power Co...	Speedway	(2)	350
Gitana	Philip DeRonde ...	50	0	10	6	3	6	Great Lakes B. Cor.....	Great Lakes B. Cor.....	Van Blerck	(1)	200
.....	H. K. Noyes.....	50	0	10	6	3	0	F. D. Lawley	Geo. Lawley & Son Cor..	Van Blerck	(1)	200
Lady Louise..	—— Chicago	50	0	9	2	3	6	F. D. Lawley	Geo. Lawley & Son Cor..	Duesenberg	(1)	400
.....	H. K. Noyes.....	50	0	10	6	3	0	F. D. Lawley.....	G. Lawley & Son Cor....	Van Blerck	(1)	200
Lady Louise.....	.....	50	0	9	10	9	2	F. D. Lawley.....	G. Lawley & Son Cor....	Duesenberg	(1)	400
.....	.....	50	0	8	6	2	1	Gas Engine & Power Co...	Gas Engine & Power Co...	Speedway	(2)	350
Gitana.....	Philip De Ronde...	50	0	11	3	2	9	Great Lakes B. B. Cor....	Great Lakes B. B. Cor....	Van Blerck	(1)	215
.....	E. C. Crossett	48	6	10	6	3	0	F. D. Lawley	Geo. Lawley & Son Cor..	Sterling	(2)	140
.....	E. E. Crossett.....	48	2	10	6	3	0	F. D. Lawley.....	G. Lawley & Son Cor....	Sterling	(2)	140
Edith	Carnot Ward.....	48	0	10	6	2	10	Great Lakes B. B. Cor....	Great Lakes B. B. Cur....	Van Blerck	(1)	215
16 Nereides...	Geo. C. Siebrecht.	46	0	11	2	3	0	George E. McLean.....	George E. McLean.....	Sterling	(1)	135
Judy VII.....	William Wallace...	46	0	9	6	3	0	W. H. Hand, Jr.....	Britt Bros.....	Duesenberg	(1)	300
.....	W. Lyman Underwood.....	45	0	10	6	3	0	W. H. Hand, Jr.....	W. H. Hand, Jr.....	Van Blerck	(1)	170
.....	Earl Holley.....	45	0	8	6	3	0	Carlton Wilby.....	Matthews Boat Co.....	Van Blerck	(1)	200
Tartar.....	Ralph Esau.....	45	0	11	2	3	6	W. H. Hand, Jr.....	Defoe B. & M. Wks.....	Sterling	(1)	110
.....	Earl Holley.....	45	0	8	3	3	0	Carlton Wilby	Matthews Boat Co.....	Sterling	(1)	200
Lynx.....	Nathaniel Ayer....	45	0	9	3	3	0	.....	.....	Sterling	(2)	500
.....	Walter Brown.....	45	0	9	0	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	Ralph Esau	44	11	11	1	3	5	H. J. Defoe.....	Defoe B. & M. Wks.....	Sterling	(1)	145
Gladyce	Wm. Cripps	44	8	11	4	4	0	Banfield B. & L. Wks....	Banfield B. & M. Wks....	Standard	(1)	50
Scout	.....	43	9	9	0	3	0	Gas Engine & Power Co..	Gas Engine & Power Co..	Speedway	(1)	130
Evelyn II	J. Walter Myers ...	42	0	10	0	3	0	J. M. Watts.....	Victor Boat Wks.....	Wisconsin	(1)	140
.....	A. F. Clarke.....	42	0	9	6	3	0	G. R. Richardson.....	Richardson B. Co.....	Sterling	..	....
Lilly Longlegs	W. Williams.....	41	8	12	6	4	0	Banfield B. & L. Wks....	Banfield B. & L. Wks....	Buffalo	(1)	65
.....	Robert Jareeks.....	40	0	9	3	3	0	Matthews B. Co.....	Matthews Boat Co.....	Sterling	(1)	75
.....	ShallowWater B.Co.	40	0	8	0	0	0	F. Reppley.....	Reppley Steel B. Co.....	Buffalo	(1)	125
Teal.....	A. Aschaffenburg..	40	0	9	0	3	0	J. M. Watts.....	W. Fetterly & Son.....	Buffalo	(1)	145
Quicksilver...	S. H. Coltom	40	0	7	0	2	6	A. E. Apel.....	Ventnor B. Wks.....	Hershel	(1)	60
.....	E. E. McCarter ...	39	0	11	0	2	6	Elwood Sprague.....	Sprague	.....	..	....
Curlew.....	S. W. Jones.....	39	0	11	0	2	6	J. M. Watts.....	E. M. Mohrman.....	Gaeth	(1)	20
Vivian II.....	Jesse Baker.....	38	0	7	6	1	8	Hunter	Everett Hunter Boat Co..	Loew-Victor	..	....
Syd	E. L. Welsh	38	0	0	0	0	0	.....	Gas Engine & Power Co..	Speedway	(1)	175
Prosit.....	A. S. Haff.....	37	6	9	2	2	4	A. S. Haff	A. S. Haff	Holmes	(1)	25
.....	J. N. Tilden	36	0	6	6	2	6	Gas Engine & Power Co..	Gas Engine & Power Co..	Speedway	(1)	66
.....	Clifford Rice	36	0	9	9	2	6	Elwood Sprague.....	Sprague.....	Mietz & Weiss	(2)	....
Charles May..	E. F. Banfield	35	9	9	8	3	6	Banfield B. & L. Wks.....	Banfield B. & L. Wks.....	Red Wing	(1)	32
.....	John Redding	35	0	9	4	2	8	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
Isabel	J. N. Willys.....	35	0	6	0	2	6	Gas Engine & Power Co..	Gas Engine & Power Co..	Speedway	(1)	80
.....	D. P. Duffie	35	0	6	6	2	6	Gas Engine & Power Co..	Gas Engine & Power Co..	Speedway	(1)	130
.....	A. G. Cooper.....	35	0	6	0	2	6	W. H. Hand, Jr.....	Gas Engine & Power Co..	Speedway	(1)	130
.....	C. H. Speer.....	35	0	8	3	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	John W. Ryan.....	35	0	8	3	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	T. Mikkelser.....	35	0	8	3	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	Fred C. Seedorf....	35	0	8	3	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	F. B. Treutle.....	35	0	8	3	2	6	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	W. Kochler	35	0	9	4	2	8	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
.....	W. J. Lewis.....	35	0	9	4	2	8	H. J. Defoe.....	Defoe B. & M. Wks.....	.....	..	....
Bully Bing	J. Riter.....	35	0	6	6	2	6	Gas Engine & Power Co...	Gas Engine & Power Co..	Speedway	(1)	130
Alaska	Col. E. H. R. Green	35	0	6	6	2	6	Gas Engine & Power Co...	Gas Engine & Power Co..	Speedway	(1)	130

HOUSEBOATS

Comfort.....	D. DeWitt	70	0	20	0	1	4	A. S. Haff	A. S. Haff.....	.....	..	....
.....	Chas. Gardner.....	56	6	12	9	4	0	Richardson.....	Richardson B. Co.....	Blount	..	....

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Our Navigating Editor Reports

The Navigating editor of THE RUDDER, Grafton B. Fish, was on the steamship New York when that vessel hit a mine outside Liverpool. A letter has been received from Mr. Fish which tells something of the accident, but the censor has done his fine work and we will have to wait until Mr. Fish gets back home to hear the whole story. The letter, which is dated "Somewhere in England, April 20, 1917", says: "Things have certainly happened since we left New York. Had terrible weather East-bound, nothing but gales, all Easterly, so we hammered our way across the pond, wet, cold and sleepy—for sleep was impossible most of the time. Thursday a large chest full of ammunition broke adrift and we had a fine game of tag trying to lash it with nearly every sea breaking over us.

"There were other things to break the monotony of which I cannot write you * * * . Monday, when we thought we were safely through—Bang! And it was a bang I shan't forget for some time. * * * So now the ship is in dry-dock. What we are to do has not been decided. If we stay by do not expect us before August at the earliest. We may come back as passengers and later take out a new boat. We wonder what is happening in U. S. A. now as it is almost impossible to get news here. I am glad U. S. declared war, for it may hasten the end of this horror."

Rudder Improves Each Month

Editor of THE RUDDER:

Permit me to compliment you on the very handsome cover of the May issue, and the big improvement which is so noticeable each month throughout your entire magazine, both editorially and mechanically.

New York. GEO. P. THOMAS.

Enjoys Reading The Rudder

Editor of THE RUDDER:

I have kept every copy of THE RUDDER since I started to read it years ago. I have not been able to do any boating for the last ten years as I have been away from any suitable waters but I enjoy reading about the sport that others are getting out of it. I hope to be back some day and have some of the pleasure of yachting. In the meantime I'll have to be content with THE RUDDER, which gives me much pleasure. It also keeps a fellow posted on what is going on in the yachting world.

California. FRED LOCKE.

The Chart Table

Editor of THE RUDDER:

In a recent number you gave a method of determining the distance off a light by means of a four point bearing. Why could you not determine the distance off by observing the bearing at any angle and noting the time and distance between that bearing and the beam bearing?

Long Island. W. WHITAKER.

You could. You have an angle and side of a right triangle from which you could compute the distance off



L = Light.
AB = Course of boat.
A = Angle of bearing of light at beginning of run.
B = Position at end of run when light is abeam.

$\frac{LB}{AB}$ = Tan. A. We know LA and the distance AB.

LB = Tan. A × AB,
or Log. of LB = Log. Tan. A and Log. AB.

But the method of four point bearings eliminates any use of tables and on a small boat in particular the less one has to compute the more accurate your work is apt to be. Many small boats do not include table of the functions of angles in their equipment although it is a good plan to have one.

The more mechanical the process the less the chance of error, so the tendency in piloting and navigation is to reduce methods and results to simple formulæ and tables whenever possible.

Editor of THE RUDDER:

Please tell me the relation between the statute mile, nautical mile, Admiralty knot, nautical knot, geographical knot, German sea mile and kilometers.

Italy. ULRICO SCHLAEPPER.

The statute mile is 5,280 feet. The geographical mile is one-sixtieth of a degree of the earth's equator, or 6,087 feet. The United States Coast Survey gives a geographical or nautical mile as 6,080.27 feet or 1,853.25 meters. The British Admiralty drops the fraction and gives it 6,080 feet while the French, German and Austrian authorities make it 1,852.9 meters or 6,076 feet. The German sea mile is consequently 6,076 feet. A meter is 39.37 inches and a kilometer is 1,000 meters, 0.62137 mile, or 3,280 feet 10 inches.

Bowditch, in his Practical Navigator, says: "The unit of linear measure as employed by navigators is the nautical or sea mile or knot. This unit is defined in the United States of America as being 6,080.27 feet in length and equal to one-sixtieth part of a degree of a great cir-

cle of a sphere whose surface is equal in area to the surface of the earth.

"The nautical mile is not the same in all countries, but, from the navigator's standpoint, the various lengths adopted do not differ materially.

"Since, upon the ocean, latitude has been capable of easier and more accurate determination than longitude, it might naturally be expected that there exists an intimate fixed relation between the nautical mile and the minute of latitude; but on account of the fact that the earth is not a perfect sphere, a fixed relation does not exist, and the arc of a meridian that subtends an angle of 1′ at the center of the earth varies slightly in length from the equator to the poles, being 6,045.97 feet at the equator and 6,107.85 feet at the poles. Its average length is 2,852.201 meters or 6,075.82 feet. Accordingly in France, Germany and Austria the nautical mile is 1,852 meters or 6,076.23 feet.

"In England the nautical mile corresponding to the Admiralty knot, is regarded as having a length of 6,080 feet.

"The statute mile of 5,280 feet, which is employed in land measurement, is commonly used in navigating rivers and lakes. This is notably the case on the Great Lakes of America, but with the recognition of the advantages to be gained by the practice of nautical astronomy in the navigation of these vessels, the use of the nautical mile is extending."

The Engine Room

Editor of THE RUDDER:

I have a four-cylinder, four-cycle engine, 5-inch bore, 6-inch stroke, 24 h.p. at 500 r.p.m.

The general equipment consists of a D-4 Bosch dual high-tension magneto with an A. coil. Coil and magneto were examined and adjusted last July by the Bosch people and guaranteed by them to be perfect.

Carbureter is a Model L Schebler, 1¼ inch, with air inlet connected with crank case, and an auxiliary air valve connected to a heater on the exhaust pipe.

Oiler to cylinders is mechanical force feed; crank case has splash system.

The trouble is that on starting, after standing a few days, it will fire on all four cylinders for about two or three minutes, after which the second and third cylinders will start to miss.

I have tried all kinds of adjustments on the carbureter, even tried a Model D Schebler without any different result.

With engine running, will let go of mooring, speed up engine slightly, and throw in clutch. The engine will run on two or three, and sometimes on four cylinders—mostly three—sometimes stops. As a rule the engine will pick up the load, still missing, and will continue to miss until boat gets up to speed, then missing stops, and the engine will run without any trouble any length of time.

Upon slowing down missing begins again until the engine is stopped.

All the spark plugs have a black soot on them except the points where the sparks jump across, which is white like silver.

The batteries and coil are used only to start with, say, for the first three or four revolutions.

I have an idea that the oil from the base gets up into the cylinders Nos. 2 and 3, and wets plugs.

After taking down the engine this Fall I found by operating plates on connecting oil pump by hand rods, it would almost empty the last pit, the vent is too small. I suppose this condition would exist when the engine is running, therefore keeping most of the oil in the two center pits. The overflow holes are very small, about 3/16-inch diameter. Pit No. 1 would just about keep itself clear adding to the amount in Nos. 2 and 3.

Upon taking off the cylinders most of the rings were turned around with the slots in the same place, in the forward part of piston.

I suppose this is due to the rings being tapered, and the engine being at a good angle.

I propose to get new rings which will have the same thickness all around.

In the first part of the season after having the engine all apart and cleaned up, rings set with slots properly staggered or spaced, the engine ran fine, but after a while missing started.

In regard to timing of valves, they all open and shut pretty much alike, that is, there may be a variation of ¾ inch at the most between two cylinders on the rim of the flywheel (20-inch diameter).

I hope I have described conditions pretty well and I will appreciate very much any suggestions you may make.

Thanking you, I am,

New York. AUGUST WEBER.

It would have been much better had you mentioned the name of the engine, for valve and inlet manifold design in some makes sometimes cause trouble similar to that you have described. The reply will necessarily have to be general rather than specific.

Your trouble is by no means an unusual one. Let us try and discover the cause by a process of elimination. It cannot be from magneto trouble, except there is a possible partial short-circuit across the distributor plate, which is hardly probable, from the fact that the engine starts readily—hitting on all four cylinders. It hardly can be blamed on the carbureter, for imperfect carburetion usually shows on the first or last cylinder, rather than on the two intermediate of a four-cycle engine.

The accumulation of oil on the spark plugs is a direct result of the missing of explosions.

The search should be for a leak of air into the inlet valve chests of the Nos. 2 and 3 cylinders. The usual place where such a leak may be found is between badly worn inlet valve stems and inlet valve stem guides. Such dilution of the gas in these cylinders by atmospheric air entering past the inlet valve stem bushings would cause the engine to run as you describe.

If again the valve lifters are adjusted so that the valves will just seat when the engine is cold, the heat will elongate the valve stems so that they will not seat properly when the engine gets hot from running.

If the exhaust valve springs have become "set" and are too weak to seat the valves properly, the engine will miss explosions. If your engine is new and the inlet or exhaust valves should not be free in the valve stem guides, you might note a blowing back of gas through the carbureter if the inlet valves are not free, and erratic running will result if the exhaust valves stick slightly.

Editor of THE RUDDER:

We are now building a trunk extension cabin cruiser 39 feet long by 9 feet breadth, and we expect to install a Buick automobile engine, Model D-45, six cylinders, bore 3¼ inches and stroke 4½ inches, with Delco self-starter and ignition system. This engine has transmission gears attached.

We have been informed that in order to obtain good service we have to use a regular marine reverse gear, and we should like to know your opinion on the subject and at the same time, kindly inform us what would be the most suitable propeller for an outfit of this kind, considering that we require speed.

Cuba. A. M. PUENTE & COMPANY.

Automobile engines are not adapted to use in trunk cabin cruisers. In the May, 1916, issue of THE RUDDER, on page 24, you will find why automobile engines are in the main not adaptable for marine use.

The six-cylinder Buick engine you intend using would be especially unsuited for a heavy boat, such as we gather from your inquiry you are building, principally for the reason that in order to develop the required horsepower to drive the boat it would be necessary to run the engine at from 1,200 to 1,500 r.p.m., and it would be a practical impossibility to find a propeller wheel which would be efficient at such an abnormally high speed. If your propeller has sufficient diameter and pitch to hold the engine down to say 600 r.p.m., the actual power it would develop would probably not exceed 10 h.p., with a consumption of fuel beyond all reason, double what an engine designed to be operated at that speed should consume. In the May, 1917, issue of THE RUDDER you will find an inquiry and reply which should interest you, as it is a similar inquiry to yours. You will find it practically impossible to keep salt-water out of an automobile transmission gear and clutch, due to the fact that the flywheel is on the wrong end of an automobile engine. Marine reverse gears are designed to prevent water from entering them until the water reaches at least up to the propeller shaft just abaft the gear. It is an expensive and usually unsatisfactory experiment to try to drive a boat with an automobile engine. With the indefinite information at hand, not knowing the number of revolutions at which you expect to run the engine, it would be impossible to advise you in the matter of the propeller with any degree of intelligence, or any expectation of satisfaction on your part.

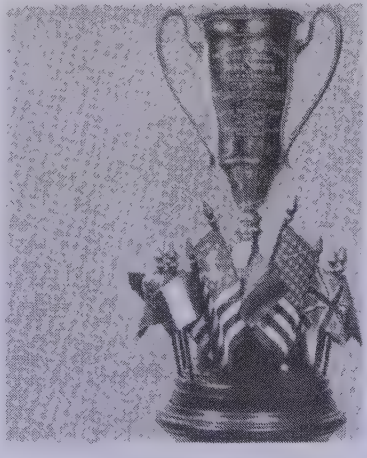
Model Yacht Cup Races

The first races for the International Cup of the Yankee Model Y. C. will be sailed on Prospect Park Lake, Brooklyn, on June 9th and 10th. This trophy, which was donated by a member of the Yankee Model Y. C. to be a perpetual challenge cup, has been turned over to THE RUDDER to hold in trust until a winner is determined according to the terms of the deed of gift. The cup is a very handsome one of silver mounted on an ebony base. Around the base are the flags of the nations eligible to compete for the prize. It bears this inscription: "The International Cup, to be sailed for without time allowance by model yachts of the 12-meter class (international rule rating). Presented June 9, 1917. In furtherance of the sport of model yachting as a scientific and instructive introduction of the major sport of yachting and yacht design. Held in trust for the winner of three successive annual races." On the other side there are spaces for the name of the winner each year.

The donor, who is an enthusiast, has arranged everything most thoroughly. The rules governing the races and winning of the prize are comprehensive and cover all points that may be raised. The prize itself is one that owners of model yachts will covet. It is enclosed in a glass case and in the base is a drawer which will hold the record of each contest, giving a complete history of the prize.

The entries will close on May 31st with George Mould, chairman of the Committee of Arrangements, 540 Fourth St., Brooklyn. To date five yachts have been named entered, the Yankee Model Y. C., two yachts, and the Boston Y. C., Brooklyn Model Y. C., Columbia Model Y. C. one each.

The course for the first races will be triangular, giving a run, a reach and a beat. Entries will be divided into classes, not more than four in a class. Each class will have four elimination races. The awards will be on a point basis and the winners of the elimination races will sail together in the final series of three races. The races will be managed by a committee composed of one member from the Yankee Model Y. C., the Brooklyn Model Y. C. and the Columbia Model Y. C.



International Cup for Model Yachts

THE RUDDER

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

Keep Yachting Alive

The progress of events since the proclamation of war demonstrates in a most conclusive manner that American yachting is prepared to meet all the demands of patriotism. On the part of the yachtsmen, the wealthy owners of the larger craft have turned them over freely to the Government, and a number of the same yachtsmen now have under construction costly patrol boats of special design to be similarly donated. The owners of the smaller craft have as a class come forward promptly with the offer of their boats; and yachtsmen throughout the nation have volunteered without a thought of possible conscription. As to the yacht clubs, they have been equally prompt in the tender of such service as may be possible to them.

So far as war is concerned, there is very little difficulty for each individual in making up his mind as to his own special duty; the offer of his yacht, his personal service or in some other line; it is only when we come to the passive and pacific side that difficulty arises.

The immediate question, which is one to be answered by clubs rather than individuals, is as to the stand which yachting should take for at least the present season? The first thought, and that on which a number of clubs and associations have already acted, is that as the country is engaged in a war of world-wide magnitude and indefinite duration all sports should cease and all the energies of the country should be concentrated on work.

* * *

There may be a time, possibly next year or a year later, when such a conclusion is obviously beyond debate; but for the present season such drastic action would be most unwise. The sober thought of the nation, so far as yet expressed, seems to be on the side of deliberate and conservative action, concentrating all effort upon the vigorous prosecution of the war, but at the same time continuing as far as possible the normal life of the people as to dress, business, and even pleasure.

This general policy, in our opinion, is the right one for yacht clubs; clubhouses open and in commission, club interest stimulated, races carried on per schedule, and as far as practicable the usual work of the Summer season.

The reasons for this national policy of Keep-a-Goin' have been well stated by many in the public prints, and no more need be said here than the one strong argument which applies directly to yachting.

The prime interests of America are on the sea, naval and mercantile; forty years ago the realization of this great fact was confined to a few seaports; thirty years ago the triple victories of the Burgess-Paine Cup-defenders awakened the first general idea of sea power throughout the inland States; but even now much missionary work is needed to drive home and clinch in the mind of every American the conviction that the national destiny must be worked out on the sea. Agriculture, manufacturing, irrigation, railroads and rivers, are trivial factors compared with a navy and a merchant marine and the men to man both.

The possibilities of the sport of yachting as a stimulus to the growth of a national interest in the sea were realized long ago by the German Kaiser with results that are only too plainly in evidence today. While our natural advantages are immeasurably greater than those of Germany, our Government thus far has done nothing, and our yachting organizations far too little, to weld the sport into a solid national unit. For the present no effort should be spared to keep yachting alive; for the future none will be too great to extend its influence throughout the length and breadth of the land.

After the War—What?

"I cannot help thinking that after the war yachting will never again be what it was before, and all unnecessary things must go. One thing I have found out in the last year or two, and that is that much of modern yacht designing must go. If I want a steamer I will have a fishing trawler, and if I want another sailing boat I will have a type of fishing boat; boats which can keep the sea and do their arduous work with next to nothing by way of crew. No more toys for me, thank you, after what I have seen, and I only congratulate myself that my old—is very near a good type of fishing boat; I am glad that she has often been mistaken for one."

This from a keen yachtsman and singlehand sailor, after two years' experience in the coast patrol, partly in a small auxiliary taken over as an emergency measure and partly in a larger power craft specially designed for the purpose. His present point of view, perhaps not unreasonable under the circumstances, is plausible and will appeal to many who object to the complexity of modern yachting by formula; but is it correct?

What may come after the war is a question that no human being may presume to answer, the upheaval of nearly all the existing institutions of the earth, and the wholesale destruction of material things, make all conjectures vain. Looking backward, however, we find some assurance in the fact that our Civil War, prolonged and exhausting to both sides, was followed in the first year of peace by a marvelous expansion of yachting through the building of a fleet of great schooners and the establishment of yacht clubs. The recuperation of France after her terrible defeat in 1871, the prompt payment of a crushing indemnity and the moral and material awakening which have been her salvation in the present war, were among the wonders of the past century. Though the connection is not plainly discernible, it is probable that the creation of a national yachting system in Germany had its origin in the measures

for both defense and offense inaugurated shortly after the peace of Paris. The value of a national yachting system, universal and well grounded in a general love of the sport, is so obvious that there is little fear that yachting will be permitted to die out in this country or abroad.

* * *

It would be foolish to depreciate the modern steam trawler mentioned by our correspondent, no finer type floats today; would that we had now such a fleet as England started with at the outbreak of the war! As to fishing craft in general, however, the world over, they are by no means the perfect specimens of naval architecture that some would have us believe. The average fishing boat of all places and periods is largely the production of chance and environment backed by conservatism and a lack of knowledge of the essential principles of naval architecture. Many are faulty in the extreme, even for their special purpose, and the best are unsuited for yachting service. The much-vaunted Gloucester fishing schooners of a generation ago had many radical defects, in common with their sisters of the sailing pilot fleet; the regeneration of the two types is due to the work of such men as D. J. Lawlor, Edward Burgess, Captain J. W. Collins of the U. S. Fish Commission, and B. B. Crowninshield; all skilled naval architects and three of them specialists in yacht designing. Another instance is found in the Norwegian pilot fleet, revolutionized by the exertions of one man, Colin Archer, a naval architect who shares with our John Hyslop the credit for the discovery and development of the theory of the wave-form curve of areas which is the basis of modern designing. It is a fact worthy of note that the work of all these men was opposed resolutely and bitterly for years by those who would profit most by it but who clung tenaciously to the old models that had drowned their grandfathers and fathers.

Apart from possible inherent defects of design, the fishing types are unsuited for use as yachts; the conditions of the two services being radically different, with little in common. For instance, the fisherman of any size is likely to be manned by a large crew, for the handling of nets and gear and the manning of boats, so that the quick handling of sails by a small crew, so vital on a yacht, is no longer a consideration.

The actual facts which underlie the complaint of our correspondent may be summed up much as follows: Yachting started well over a century ago with fishing types and smuggling luggers and cutters as models; the development of rather more than half a century reaching the high tide of yacht designing in a fleet equally capable of racing and cruising. For another quarter of a century this fleet was refined to meet the needs of modern yachting; then the craze for extreme speed and the introduction first of the fin-keel and then of the scow type brought about the conditions existing a few years ago. The remedy is not to be found in discarding all modern yachts for the apple-bowed, stone-ballasted fisherman, but in moderate and judicious legislation along the lines in use for the past few years, continually raising the standard of design and construction. Much has been done by the adoption of the Universal rule here and the International rule and scantling restrictions abroad, and a continuance of the work along the same lines should keep the sailing fleet and yacht racing alive for many years after the war.

The first step toward the development of the perfect yacht, whether power or sail, is the recognition of the fact that the yacht is a distinct type; having nothing in common with other types. It is safe to say that there is nothing to be learned today from the fishing type; a competent yacht designer working under reasonable limitations will produce a better yacht from his own knowledge than from anything the fishing fleet can teach him. At the other extreme, the yacht has nothing in common with the naval type, and every attempt to combine the two must inevitably result in failure. What may be necessary in an emergency such as the present is another question, but as a broad proposition the designer who induces his client to build a caricature of a war vessel is injuring the sport in a way which must ultimately react on his own business. The subject is too big for discussion here, but it is worthy of the serious consideration of both owners and designers.

Lessons from British Boats

The building of 550 submarine chasers for the British Admiralty in less than a year and a half was a gigantic undertaking and the story of how the big work was accomplished makes such fascinating reading that several pages of this month's issue have been devoted to it. The boats, all reports to the contrary notwithstanding, have proved eminently satisfactory and have done great work in the different parts of the service to which they have been assigned. Just now the Navy Department is trying to get a fleet of similar boats for patrol duty but judging by the way things are progressing they may have about two hundred by the end of the year, nine months after the orders were placed. These boats, which are 30 feet longer than those used by the British, are to be built by thirty private builders and six Navy yards. The way the Elco Company carried out their big task should furnish a serious study to those who are handling the American boats, particularly to the Navy Department or rather to its head. With some systematic organization and the help of thirty builders it would have been a comparatively easy matter to have built a thousand boats before the end of the year.

Yachtsmen Not Unreasonable

Assistant Secretary of the Navy Franklin D. Roosevelt has stated that yachtsmen are holding their yachts at prices much too high and he advocates the passage of a bill which will empower the Government to commandeer all the yachts and other vessels needed for Coast patrol work. Mr. Roosevelt includes owners of commercial vessels in the class with the yachtsmen and instances one man who owns a vessel engaged in fishing who wanted to make a profit of $80,000 on his boat. He however does not tell of any yachtsman who was so ambitious. Yachtsmen as a whole have been very liberal. They have built boats specially suited for patrol service according to the plans of the Navy Department, they have in many instances donated their yachts and are maintaining them now free of expense to the Government and numbers have enrolled in the service. Others have offered their vessels under varying terms, some will charter, and others will sell. More than twelve hundred were offered.

Some placed prices on their yachts, and for some, a Board of Appraisal fixed the prices. Now the trouble is that the Navy Department and its Boards of Appraisal look at a vessel only from one viewpoint. The valuation is

placed on the hull and the engine and when a vessel is purchased the costly interior fittings are usually ripped out and junked. The man who owns the yacht has had it fitted to suit his own tastes. The fittings may not be of any use to the Navy. They certainly are not to the owner unless they are in the yacht and the Navy Department if it wishes to purchase should pay some part at least of these fittings. Another thing to be considered is the increased cost of yacht building. Many vessels that have been offered could not be duplicated for double their original cost even if a yard could be found where a yacht could now be built. The yachtsmen as a whole are very reasonable. They have entered heartily into the work of defending their country and with their help there might today have been a fair-sized patrol fleet had the Department started to work earlier or if it had not changed its plans so often. There are several hundred boats suitable for this work which with a little proper organization can be taken into the service if the necessary guns for their equipment could be obtained.

Spokes from the Rudder Wheel

With THE RUDDER staff "all shot to pieces," so to speak, it has been a very serious matter to get out this month's issue but it is out. Unfortunately it has been impossible to determine who have won the prizes in the designing competitions for the prizes offered by THE RUDDER. The judges, too, who kindly agreed to pass judgment on the many attractive plans that have been sent in are also hard pressed for time just now, so we must ask the indulgence of those who are striving for honors. The plans have all been arranged and classified and it is hoped that by next month we may announce the names of those who have been successful and publish some of the plans.

* * *

Mr. Charles Desmond, who is "doing his bit," has been unable to furnish the continuation of his article on "Designing of Marine Gas Engines" which is running in the Quarter-Deck Department. He has been working at high pressure of late but hopes to be able to continue this very instructive series of article in the next issue.

* * *

The American Power-Boat Association recently offered its service to the Navy Department in order to stimulate enrollment from the members of the 149 clubs in the association. The Department in reply said that the association is in a position to render effective service and asked that each club communicate directly with the commandant of the district in which it is located.

* * *

The members of the Seawanhaka-Corinthian Y. C. who recently formed a class in navigation are meeting each Thursday evening at the St. Nicholas Club, 7 West 44th St., New York. Lieutenant John Walter Wilcox, U. S. N., is conducting the course of study.

* * *

Announcement is made by the New York Motor Boat Club of its ninth annual long-distance race from New York to Albany and return. The start will be at 2 p. m. on Saturday, June 30th. The race is for cruisers except the express class under 50 feet over-all length. Entries will close at 6 p. m., June 28th. A fee of $5 must accompany each entry which will be returned to those who start. H. J. Allen, 548 West 164th St., New York, is the chairman of the committee.

* * *

The Navy Department has contracted with the Gas Engine & Power Company at Morris Heights to make changes and fit out many boats that have been turned over to the Government for patrol and other duty. The yards at Morris Heights are full of vessels. No better yard for such work could be found and instead of junking the fittings, as has been done in other yards, they are taken out, stored and will be ready to replace after the war.

* * *

Commissioner George R. Putnam of the U. S. Lighthouse Board has written a fascinating history of the lighthouses and lightships of the United States. It starts from the beginning and is interesting all through. This book can be secured through the Book Department of THE RUDDER as well as any others yachtsmen may want. Particulars of the books, many of which are kept in stock, may be found in another section of this issue.

* * *

The Quincy Y. C. has issued a neat little book giving its schedule of regattas for this season. The season lasts from May 26th until September 9th inclusive and there will be races every Saturday and holidays. The clubhouse was formally opened on May 16th.

* * *

Some of us are too old to enroll in the Naval Reserve or to enlist in the Army. We can help in other ways. Subscribe for the Liberty Bonds and help pay the cost of the war. Join the Red Cross and help it in its great work to relieve the sufferings of those who go to the front.

* * *

Captain George S. Laing, 20 Gibson Avenue, Toronto, an occasional contributor to THE RUDDER, is raising funds with which a memorial of Captain Charles Fryatt is to be erected. He appeals to those Americans who are interested in the sea to help in this object. Part of the money so raised is to establish a fund "for the benefit of distressed merchant captains and officers, or their dependents, caused primarily through the war."

* * *

At last the channel through Hell Gate is to be deepened and widened so that warships can pass through safely and give two entrances to New York. The New York Legislature has passed a bill to cut a canal from Jamaica Bay to Peconic Bay provided the Federal Government agrees to help.

* * *

A very pretty way of showing appreciation to those who are to serve in the war has been adopted by the Church of The Incarnation (P. E.), Brooklyn. A roll of honor is to be placed in the vestibule of the Church. This will be a board or frame suitably inscribed and on it will be the names of all who have entered the service of the country either in the Army, Navy or Marines. Already there are fourteen names on this list and it will be much larger.

THE RUDDER

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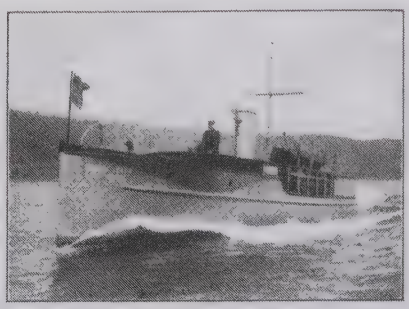
Vol. XXXIII JULY, 1917 No. 7



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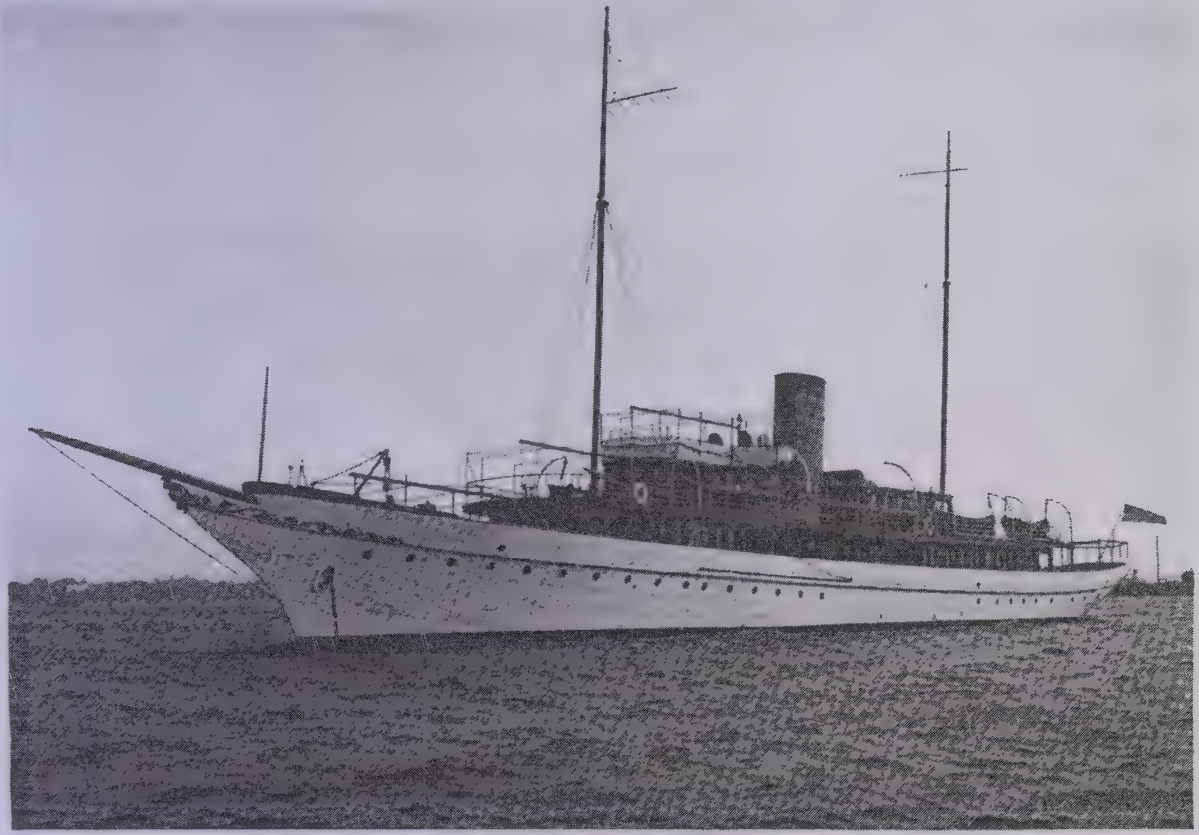
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A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII July, 1917 No. 7

Vice-Admiral William Sowden Sims, U.S.N.

By Walter Scott Meriwether

IT is likely that the world will soon hear very much about the doings of the American destroyers now operating with the Navy of the Allies and of the brilliant officer who commands the detachment, Vice-Admiral William Sowden Sims.

In the old Navy the writer served three years on the same vessel with this officer when he was an ensign, and although thirty years have lapsed since then, Sims still retains all of the youthful exuberance of spirit and splendid optimism which characterized him during his earlier days. His motto is to "Always keep Cheerful," and on every ship he has commanded this motto, and its companion one "Cheer Up!" has always been displayed in his cabin.

Sims, then a lieutenant, first came into prominence when he woke up the Navy to its shortcomings in the matter of target practice. That was after the battle of Santiago and when our ships, although they destroyed the Spanish fleet, made only about 3% of hits.

Never before that short-lived conflict had the Navy given serious attention to target work. What its previous efforts had been may be illustrated by an anecdote which relates how one of the old cruisers of the old Navy had gone out in a perfunctory way to expend the amount of ammunition which Department regulations required. It was regarded as a nuisance and a bore, and when the gun-captain of the first gun which had a go at the target smashed it into smithereens—he being unusually lucky or unusually adept—the necessity of rigging another target was regarded as an added injury. Then when his second shot smashed the second target, an unheard-of performance, there was more complaint about the unnecessary "freshness" of this particular gun-pointer. And, as the third target was being laboriously lowered over the side, the captain of the ship sent word to this gun-captain that if he hit that target again he would put him in the brig.



Vice-Admiral Sims (left) and Aide at the Recent War Conference in Paris

To Sims more than any one else is due the credit for bringing about our great reform in naval gunnery. It was directly after Santiago, that Sims, then on the China station, began writing letters to the Navy Department urging it to devote more attention to target work. So far from any heed being paid to the letters they were not even answered.

"I was young and innocent at that time," he recently told the House Naval Committee, "and I supposed that when such things were brought to the Department's attention they would jump at the chance to rectify them, and it was not until some time afterwards that I

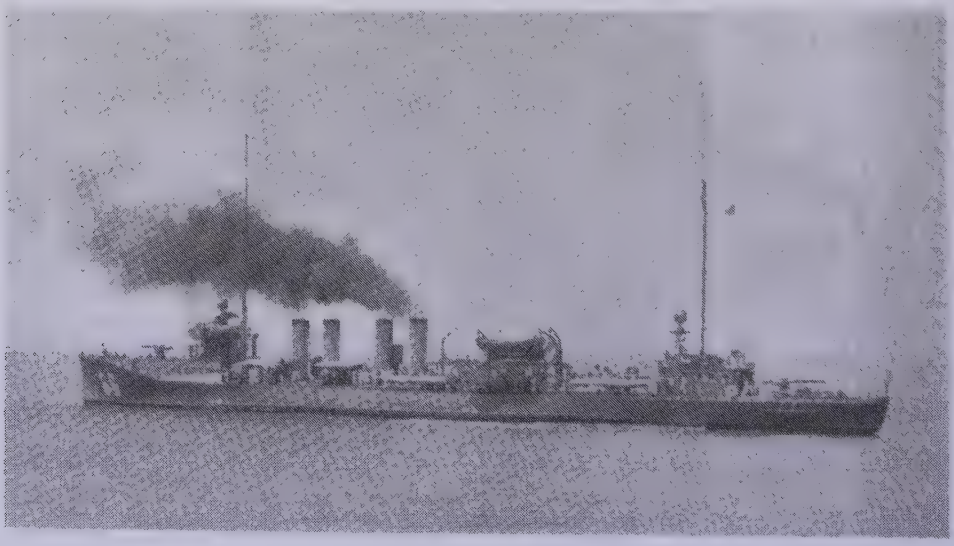
found not only that there was nothing being done, but that there was nobody in the Navy Department who had heard about those reports. I wrote a great many of them from China, and I used deliberately rather unofficial language, because I wanted to tear something loose, but I saw later that it was an entire failure. I therefore wrote a letter to the President of the United States and wrote it over the head of the commander-in-chief of the China station, and over the head of the Navy Department.

"That is the rankest kind of insubordination, but, according to my idea, when a situation arises where you know you are absolutely right, complete military subordination becomes cowardice. I conceived it to be my duty to take the chance; I did not know the President at that time. He went into the matter with the Navy Department, particularly in reference to target practice, and we were extremely inefficient in that respect at that time. The British Navy was then beginning to do some wonderful stunts. After investigating the thing, I received cabled orders to come home from China, and was placed in charge of target practice. Now, I do not claim any credit for what resulted, but we immediately bounded up with our shooting, because I brought home the ideas that were originated by that wonderful man, Vice-Admiral Sir Percy Scott, and since that time we have gone along quite well in target practice.

"To show you how it is coming up I will explain what it was like in the Fall of 1914. It was stated at that time in the press—that we were just as efficient as we ever had been. The press asked for the scores, and they were told that they were confidential. 'Confidential' means, in almost all cases, 'unsatisfactory.' You will notice that when the shooting is good the scores are not the slightest bit confidential. The shooting they have done at Guantanamo this Winter, some of it, has been very good and it goes into the press; the bad end of the record you will never see, probably. I remember once when our shooting was at the top notch with great pride taking the list of the scores made by the battleships of the North Atlantic Fleet to the Secretary of the Navy, and I said, 'Look at that.' He replied, 'That is fine.' But he looked down at the bottom of the list where there was a ship that had had something to happen to her firing mechanism, and in consequence did not make any hits at all, and another ship which had not made many hits, and he said, 'Do not publish those.' I said, 'Those are the very ones I want to publish; I want particularly to publish those that fell down.' He said, 'Nothing doing.'

"Now, about this business of various matters being 'confidential.' I have been naval attaché for four years in France and in Russia; I have had a good deal to do with the subject of 'confidential' information, and it is my absolute belief that we do not fire a shot or make a hit in this Navy that is not promptly reported on the other side. They would be very stupid if they did not do it; they would be very stupid if they did not put some of their men in our Navy, and enlist them in there. I know it is done abroad in other navies. I have never come across any particular case of it being done here. When those people want such information they will spend money to get it. I know of a perfectly authentic instance of an attaché abroad paying bribes to officials of companies to get a look at their books; to see what certain equipment was being built for. The bribes paid were £14,000, or about $70,000.

"I give you that little incident to show what they are willing to do abroad in order to get information. I might



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U. S. S. Destroyer, Allen, 1,075 Tons Displacement, Which, With Engines of 17,500 H.P., Can Make 30 Knots. The Allen May Be One of the U. S. Fleet Patrolling in European Waters

supplement that by saying that I have known people abroad to be under subsidy of $200 a month on the chance of being able to get something, and paid for special information besides. I have known an effort to be made to get information at one time, many years ago, about the submarines of a certain nation, and the question was asked, 'How much is there in it?' and they answered, 'Anything you want. There is no limit to it. What do you want?' The reply was, 'Ten thousand pounds,' and they put down a thousand pounds to start with. When those people want information about our target practice they get it; and there is only one class of people who are really ignorant about these subjects, and that is the American people. We want the truth about it. The Navy is perfectly willing to have the truth published and take its licking from the press, and let the people know where it stands."

This little gem, which aptly illustrates the widely divergent viewpoint of a technical Naval officer and the lay examiner, should not be lost to history. It was while Sims, then a captain, was commanding the new superdreadnought Nevada, that he was summoned to testify before the hardy tars of the House Naval Committee. Sims was advocating the immediate construction of battle cruisers when Representative Roberts, one of the committee, interrupted to ask:

"The comparatively light armor carried by battle cruisers would not enable them to maintain their position ahead of the fleet, would it?"

Captain Sims. Oh, yes.

Mr. Roberts. I mean the armor itself would not be effectual in maintaining that place?

Captain Sims. Oh, no; the speed is what keeps them there.

Mr. Roberts. If the armor is no factor in maintaining that position in battle, why have any armor there?

Captain Sims. You need not have much for that particular function, but your battle cruiser has to do many other things. Your battle cruiser may have to fight other battle cruisers, and if the one has armor and the other has not, she will have no chance on earth.

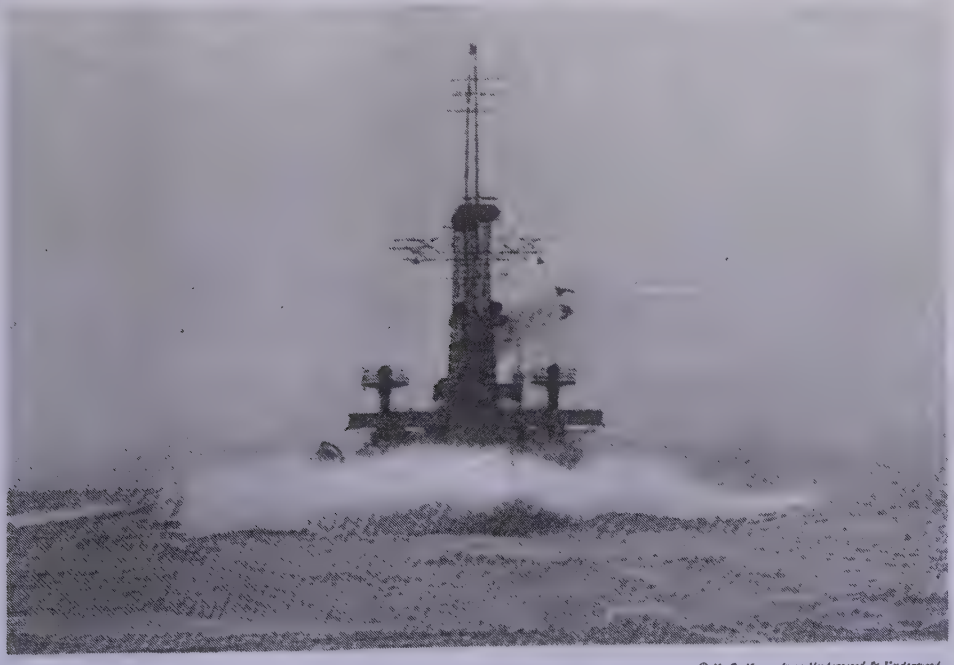
Mr. Roberts. If you get more speed with your cruiser and have an equally powerful gun—

Captain Sims (interrupting). That speed will only put you on the bottom of the ocean sooner, because it will get you up against guns that will send you there sooner.

Mr. Roberts. You could run away from it?

Captain Sims. But you want to run toward it.

Among Sims's important commands have been the battleship Minnesota, the destroyer flotilla, the submarine division, and the superdreadnought Nevada.



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U. S. S. Wyoming at Full Speed. Length 554 Ft., Breadth 93 Ft. 2 In., Draught 28 Ft. 6 In. Displacement 26,000 Tons; H. P. 31,601; Speed 21.32 Knots. Armament Twelve 12-In. and Twenty-one 5-In. Guns

Naval Reserve Activities

THE patrol fleet is growing and so far it is made up of yachts which have been donated, lent or sold to the Government and which have been refitted, strengthened and had guns mounted. Several hundred yachts were offered to the Navy Department under varying conditions and in the Third District alone about three hundred and fifty of these have been accepted. In the other districts, too, many have been accepted and are now on patrol duty. Unfortunately there seems to have been some bungling in the methods of the Navy Department and through lack of system many delays have occurred. The fleet is nothing like as large as it should be but perhaps in a measure the difficulty in getting guns is partly accountable for this delay.

In addition to the yachts, many other vessels have been taken for the coast patrol service and now mine sweepers, harbor patrols, despatch boats and mine layers are in service. These boats are manned almost exclusively by members of the Naval Reserve and, according to a statement issued by the Navy Department, the Naval Reserve force now numbers about 30,000. Of that number about 24,000 are men, 725 women, and nearly 4,000 have qualified as officers. This force includes the Fleet Naval Reserve, the Naval Reserve, the Naval Auxiliary Reserve, the Naval Reserve Flying Corps, the Volunteer Naval Reserve, the Naval Coast Defense Reserve, and the women enlisted for special duty. The First and Third Naval Districts, with headquarters at Boston and New York respectively, have each about 9,000 enlistments; the Second District, with headquarters at Newport, is next with 3,000; the Fourth District, at Philadelphia, has 3,000, and the Fifth District, at Norfolk, has 1,500.

Hundreds of sailors, fishermen, and seafaring men have been enlisted, and yachtsmen, and others with some experience have joined the Naval Coast Defense Reserve. This force seems to have a special attraction for college men, nearly every college and university in the East and many in the West and South furnishing recruits. Yale, Harvard, Princeton, Cornell, and Brown are among the institutions most largely represented. Nearly all the members of one class from Cornell went to Newport and enlisted as seamen.

Most of the men in the reserves will be required for the coast patrol fleet, which includes mine sweepers and mine layers, submarine chasers, patrol boats of various classes, as well as hundreds of vessels required for coast defense. In addition the Reserves will furnish men for guard duty at Navy yards, magazines, storehouses, and other points, and for the crews of merchantmen taken over by the Government.

Nearly all of the women enlisted are engaged in clerical duties, and rank as yeomen. Among these are several chief yeomen, engaged in special work. One is an expert on finger prints, and is employed in the identification section. Another, experienced in contracts and specifications, is employed in the Bureau of Supplies and Accounts. There are several women draftsmen, but most of the women are engaged in accounting, typewriting, and stenography in the various divisions.

The Naval Training Association of the United States, of which Commodore George F. Baker, Jr., was chairman of the Executive Committee, is largely responsible for the success in enrolling so many in the Naval Reserve, and it has been very busy at its different quarters in each district. Now the work done by that Association is to be transferred to the Navy Department. In an official announcement, signed by Thomas Newhall, secretary, it says:

> When the United States entered the war the Navy Department informed the Naval Training Association of the United States that no further camps or cruises for the naval training of civilians could be held except for men enrolled and on active service in the Naval Reserve Force.



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Ensign Hatch, U. S. N., Examining Naval Reserve Recruit at Hotel Biltmore Gun School



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Naval Reserve Recruits at League Island Camp Taking First Lesson in Gunnery

Upon request of the Secretary of the Navy the Naval Training Association thereupon directed its efforts toward obtaining enrollments in the Naval Reserve Force and, with a view to close cooperation, the headquarters office of the Association was moved to rooms adjacent to the headquarters of the United States Naval Reserve Force in the Third Naval District, at 26 Cortlandt Street, New York.

The enrollment has now reached a point where it is felt that the activities of the office staff involve a duplication of the work which is being done by the officers of the Naval Reserve Force, and the officers of the Association have therefore decided that the expense of maintaining the New York office is not justified and that after June 15th the headquarters shall be transferred to the office of the Secretary, 1411 Chestnut Street, Philadelphia, Pa., where all communications should be addressed. The Association will continue to do whatever may be found most helpful in connection with the Navy.

Comparatively few of the men enrolled in the Reserve are on active duty. As each one was accepted he was told that as soon as he was needed he would be notified, and the large majority are still waiting. Admiral Usher and other Naval officers appreciated that these men, many of whom have had little or no sea experience, would be of little use without some training and that if that training could be had before they had to go on board the patrols they would be so much better off. In the Third District it was suggested that a camp should be found where the four or five thousand men could be drilled and taught some of their duties. A site was found and the owner was willing to rent it to the Government for a comparatively small sum, provided it was put into its present condition when it was surrendered to the owner. This piece of property had four miles of waterfront and ranges could be established on the shore for the guns. The matter was referred to the Department at Washington and was turned down on account of the expense.

It was announced that there were schools of gunnery for the reservists but, try as they would, only one Colt machine gun and one one-pounder could be obtained from the Department, and one Lewis gun was lent by the manufacturers.

It has been the same with the engineers, or machinists as they are termed, on the power boats. There has been little training for the men and there consequently will be many breakdowns when the boats get on patrol.

In spite of the accusations made by Assistant Secretary of the Navy Franklin D. Roosevelt that the yachtsmen were not helping and were holding their yachts for high prices, the records show just the opposite. The yachtsmen are helping in this war more than any other division of sportsmen. It is perhaps right that they should, because their sport gives them some training for just such work as they now have to do. Those who will patrol the coast know the waters, the tides and the general conditions better than any, even the Naval officers. In selecting them for patrol work attention has been paid to the locality with which they are familiar and in this work they will be of inestimable value.

The records show, too, that the yachtsmen have been very liberal in turning over their yachts to the Navy. Many have practically donated the yachts and some are also defraying the cost of maintaining them. Others have paid for the necessary strengthening and changes needful to make the vessels fit for the work. It seems a shame to rip out the costly interiors, but when steel supports for gun mounts had to be put in and when room had to be found for crews, for ammunition and supplies, the paneled interiors and costly skylights and domes had to go out. At some yards these fittings have been stored away and may be put in again after the war, if the yachts are then any good and are needed for yachting.

It is true that some owners and the Government could not agree on the prices to be paid. The owners, as a general rule, only asked for a fair return for their yachts and naturally figured on the cost and the present increased price of materials and labor. When these differences occurred the Government suggested that the owner should name one representative and the Navy Department another and these two, as a board of ap-



Corsair in Her War Paint. Steam Yacht Owned by Vice-Commodore J. P. Morgan, Now Somewhere at Sea on Patrol Service

praisal, should determine what was a fair price. The decision of that board was to be final. In more than one hundred instances these boards were appointed and prices agreed on, but when the contracts were sent to Washington to be approved they were held up. Perhaps some fifth or sixth assistant to the Secretary felt that it was up to him to be economical, or perhaps the Secretary himself had the orders issued. At any rate someone got busy and telephoned or wrote to the owners, urging that at the present critical time the owner might be willing to accept, say, $25,000 less than the price agreed on. The owners, however, were business men and they so told the representative of the Department. They pointed out that each side had agreed to abide by the decision of the boards of appraisal and they expected the Government to live up to its agreement.

There was delay. Work stopped in the many yards because there were no more boats to be overhauled. Then the Department organized what is known as the Special Board of Patrol Vessels whose duty it was to secure suitable vessels for patrol work with all possible dispatch. One of the first moves of this Board was to have the International Mercantile Marine Company designated as official agents of the Special Board. The International Mercantile Marine Company's large staff of shipping experts, all of whom are giving their services without remuneration, got busy. This arrangement relieves the Navy yards of much work because those yachts purchased through the International Mercantile Marine Company are fitted out in other yards. That company supervises all the alterations above and below decks, arming, outfitting, coaling and provisioning the ships and delivering them, painted in war colors, to the Navy Department for sea-duty. The vessels taken by the Special Board must be over 110 feet long and suitable for offshore work. Among the yachts taken in this way are: Carola IV, Nokomis I, Emeline, Wanderer, Corona, Zara, Remlik, Sialia and Alcedo. The International Mercantile Marine Company appeals to yachtsmen to offer their yachts at once and not wait for the passage of a bill now before Congress authorizing the requisitioning of all available boats.



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General Bedell, Chief Naval Scout, Swearing in Chinese Boys as Junior Naval Scouts

Those who have enrolled in the Coast Defense Reserve have been asked if they won't transfer their enrollment from No. 4 to No. 2 division of the Naval Reserve forces. Those in No. 2 can be sent abroad and it is assumed that men are wanted to man vessels that are to go to the other side of the Atlantic and operate in the blockade squadron. It is an open secret that several of the larger yachts are already operating with the torpedo-boat destroyers on the other side and that more are to go. It has also been rumored that it is very possible that the 110-footers when they are ready will be sent to fight the submarines. Some, however, are pessimistic about the 110-footers, and say that they will have to demonstrate their seaworthiness and speed off the coast here before being sent across.

At the Navy yards the work on these boats is progressing favorably, as it is in some of the best equipped of the private yards, but of the two hundred being built privately only one-half will be finished on time, in the opinion of an expert, who knows the boats and the means some of the yards have for doing the work.

It is very possible that 150 or 200-footers will be built for the work of fighting the submarines. Some vessels of these sizes are now being built and, if they prove satisfactory, it is very probable that a large fleet will be built of steel by standardized methods and the whole fleet, complete with turbine engines, completed in very short time.

Had Major-General Goethals or some equally capable engineer been put in charge of the work of building the patrol boats, by this time several hundred would have been nearing completion.

A partial list of the steam and power yachts that have been taken by the Government, some purchased, some chartered and several donated by their owners, is as follows:

STEAMERS

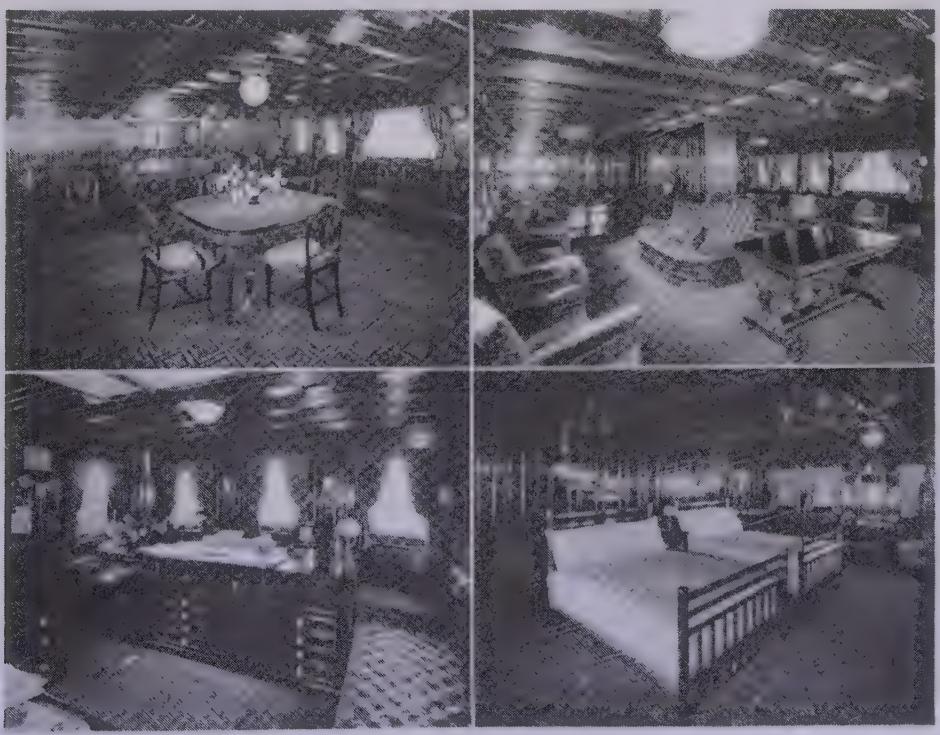
Name and Owner	Length
Alcedo, G. W. C. Drexel	275
Aloha, A. C. James	218
Arcady, Arthur Meeker	140
Atlantic, J. C. & N. F. Brady	185
Aztec, A. C. Burrage	260
Carola IV, Leonard Richards	157
Christabel, I. T. Bush	164
Corona, H. A. Loughlin	172
Corsair, J. P. Morgan	304
Emeline, Robert Graves	196
Florence, E. P. & J. W. Alker	124
Freelance, F. A. Schermerhorn	137
Gem, Wm. Ziegler, Jr.	164
Guinevere, Edgar Palmer	197
Harvard, (Wacouta) G. F. Baker, Jr.	243
Isabel, J. N. Willys	240
Joyance, W. H. Childs	135
Kanawha, John Borden	227
Lyndonia, W. A. Lyndon	214
Malay, Mrs. C. E. Weld	150
Narada, H. Walters	224
Niagara, Howard Gould	282
Nokomis, Horace E. Dodge	180

Nokomis a Floating Palace

NOKOMIS is the name of Horace E. Dodge's new steam yacht which was completed, tried and accepted by her owner last month. The new yacht, the largest built in this country, and for that matter in any other country in several years, is probably the most artistic in furnishings and fittings and the most up-to-date in all details in the American fleet. Mr. Dodge has owned several yachts; the last, also named Nokomis, he recently turned over to the Navy Department for use in coast defense and his new yacht is now somewhere on the Lakes.

The new Nokomis, like her predecessor, was designed by Gielow & Orr and Henry J. Gielow of that firm superintended the construction of the vessel at the yards of the Pusey & Jones Company at Wilmington, Del. About two years ago, when Mr. Dodge placed the order for the present Nokomis his instructions were that the new vessel should be a thorough seagoing vessel, with all modern up-to-date features; in fact, the vessel was to be the last word in naval architecture and marine engineering How well Mr. Dodge's instructions have been carried out the Nokomis shows with very little explanation. Every detail has been worked out most completely. All the interior fittings and furnishings were especially designed and a careful study made for each room to make all the decorations harmonize and to make the yacht artistic without being ornate. All the chairs, tables, sideboards, buffets, dressing tables, bedsteads, were made from special designs, and the rugs, draperies, upholsteries, etc., were also especially designed and the color effects carefully worked out for each room. Great care too was taken in the lighting of the interior of the yacht.

Nokomis is 243 feet long over all, 203 feet on the water-line, 32 feet breadth, has a mean draught of 12 feet 10 inches and her depth of hold is 19 feet 6 inches. These general dimensions show that she is a vessel of a powerful cruiser type. The lines while showing power



Palatial Apartments of Nokomis

Dining Room, Chart Room and Office

Social Hall, Owner's Stateroom

are very easy, extending in fair curves from stem to stern. Her sheer is graceful and the whole appearance of the hull clean cut and artistic. The deck is flush and runs the full length of the vessel in an unbroken sweep. The bulwarks are of steel finished with a mahogany rail. The yacht is fitted with one smokestack and two polemasts from which is suspended the wireless antenna.

The hull is built of mild steel from 60,000 to 68,000 pounds tensile strength, and practically equal to marine boiler plating. The plating is worked in in-and-out strakes, thus giving the strongest possible construction. No attempt was made to economize in weight, because the main object in view in the preparation of the design was to build a thoroughly substantial vessel capable of going to sea at any time.

While no expense was spared to obtain the very best and highest grade of material for hull and machinery equal care and attention were given to the joinerwork and decorations. The skylights and deck fittings are of solid mahogany, finished bright, and the saloons and staterooms are finished in mahogany and white enamel.

The deckhouse is of steel and is 140 feet long with 7 feet 4 inches headroom. A shade deck extends to the sides of the hull for the full length of the house. At the after end of the house there is a shelter hood with glass side panels, which is furnished with a divan and chairs. All the owner's and guests' accommodations are in the after part of the vessel, and the crew's quarters are forward.

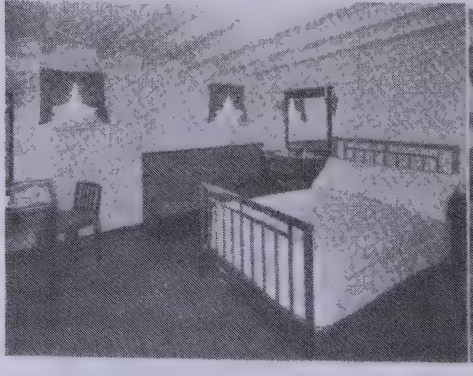
On the upper, or boat deck, there are two structures, one forward and the other aft of the funnel. The forward house is 28 feet long by 12 feet wide in the clear. The captain's stateroom is in the forward end of this house; it is fitted with a large berth, wardrobe, divan, and a separate toilet and lavatory. Aft of this is the wireless room, arranged to hold all the apparatus, also commodious living accommodations for the operator. The house aft of the funnel is 32 feet long by 12 feet wide. The forward length of 21 feet is fitted up as a gymnasium, and aft of this is a shelter hood with a cosy corner, divan, etc.

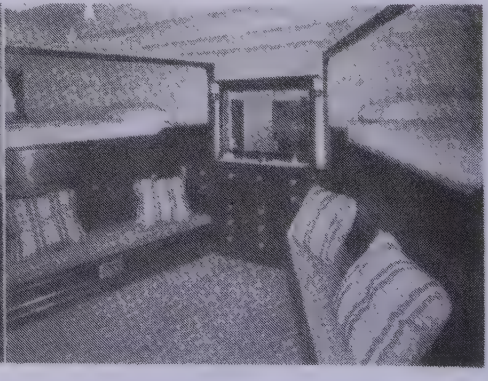
The dining room is on the main deck, immediately forward of the engine room casing. It is 18 feet long by 20 feet wide and fitted with a buffet and sideboard in the after end. Forward of the dining room on the starboard side is the pantry, which is fitted with the necessary dressers, dish-racks, lockers, sink and steam table. On the port side of the pantry are staterooms for the stewards. Aft of the dining room on the starboard side is a vestibule with a door leading on deck. Aft of the vestibule is a lavatory, and aft of this a barber shop. Inboard of these is the engine room casing, and on the port side are two staterooms for the engineer and his two assistants. Next comes the ship's laundry fitted with all modern up-to-date machinery operated by electricity. Aft of this is the boiler housing. Aft of the boiler housing is the owner's bathroom and a large wardrobe, and next to this comes the owner's stateroom with a floor space of over 300 square feet. This is followed by a living room 24 feet in length by 20 feet in width, aft of which is the lobby, with a stairway leading to guests' quarters below. On the port side is a lavatory. Aft of this is a shelter hood with divans and cosy corner. The quarter deck is 42 feet long.



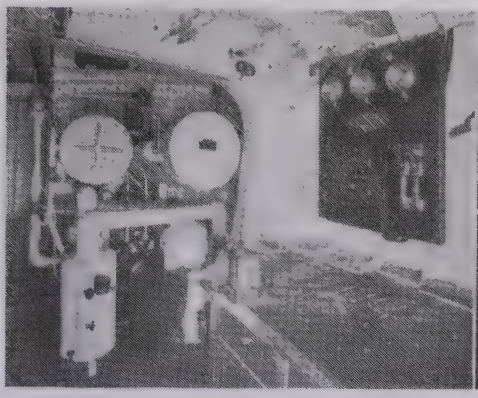
Galley, Large Enough For a Big Hotel

The quarters for the officers and crew are forward of the machinery space. Immediately aft of the collision bulkhead is a toilet room for the crew, 5 feet in length, and full width of the vessel, fitted with two lavatories





Two of the Daintily Furnished Staterooms on the Nokomis



Switchboard, Electric Controls, Etc.



Engine Room of Nokomis

and two toilets. Aft of this is a forecastle 25 feet in length, fitted with folding berths, transoms, lockers, and with a wardrobe for each man. The officers' quarters and messroom occupy a space of 26 feet fore and aft, extending the full width of the vessel. In addition to the messroom there is a large toilet and bathroom on the port side. There are eleven officers' staterooms, each with a wardrobe, bureau, mirror, transom seat, and two berths. Aft of this are two galleys, one for owner and the other for crew, each fitted with a refrigerator, ice-box, cooking range, dressers, sink and dumbwaiter.

The yacht is lighted by electricity, the generating sets being operated by steam turbines, and in addition to this, there is an Edison storage battery of double the capacity that is usually placed in a yacht of this size. Instead of the conventional way of heating the yacht with lines of steam pipes and radiators, this is accomplished with a system of thermofans, supplying heat in cold weather, cool air in hot weather, and ventilating the yacht under circumstances when the atmospheric conditions are not favorable for natural ventilation.

The water tanks are carried below the cabin floor, and running water is supplied to all the lavatories, etc., by means of air pressure supplied by electric pumps. The vessel's equipments also include an ice-making machine and refrigerating plant, which, together with the large fresh water tanks, coal carrying capacity, etc., enable the craft to go offshore for a considerable period of time.

The vessel is propelled by a pair of three-cylinder triple expansion engines, driving twin screws, so that in case of an accident to one set of the propelling machinery, the other set will still be able to drive the vessel at fully eight-tenths of the maximum speed. The boilers are of the Babcock & Wilcox water-tube type, the same as used in the United States and British navies; they are set in a watertight compartment facing each other, each piped up completely with pumps, etc., cross connected, so that one can be run entirely independent of the other.

Nokomis has a fuel capacity of 380 tons of coal, carried in bunkers alongside of the boilers and an athwartship bunker. This is a much larger fuel capacity than is usually found on yachts of similar dimensions, and will insure an exceptionally large cruising radius at different speeds.

The yacht is equipped with seven boats, consisting of a 35-foot express launch, with a speed of fully 40 miles an hour, a 30-foot service launch, two 21-foot power launches, two regular metallic lifeboats, and one power lifeboat. In addition to this the yacht is equipped with the necessary life-preservers and life-saving devices as required by the United States Rules and Regulations.



Juliana, J. A. Dowling, Owner, 75-Foot Cruiser; Built by Lawley, and Equipped With Two Model F Sterling Engines. Cruising Speed 12 Knots

Yachts for War and Pleasure

Vessels suitable for patrol duty are still being built as fast as possible, and in many instances as fast as they are finished they are turned over by their owners to the Navy Department for Coast Defense work. Other vessels are being built for pleasure, and the descriptions of the needs of war and peace and their pictures make most interesting studies.

Marjo Makes Fine Run

Marjo, a 40-footer built by the Albany Boat Corporation for Joseph McAleenan, of New York, made a fine run down the Hudson River on Saturday, June 2d. With her owner and a party of friends on board she left an anchorage off the Albany Y. C. and ran to the Columbia Y. C. off 86th Street, a distance of 138 miles. Her time was 5 hours 23½ minutes, which is at the rate of 25.6 miles an hour. The best previous time for this course was 5 hours 43 minutes, made by Flyaway III in 1915. The Flyaway III's run was made going up the river and she averaged 23.68 miles an hour. The run down was a little slower. Owing to lubrication troubles Marjo had to stop for 39 minutes when near Kingston Point. But for this delay she would have beaten the best average time made by Countess last year, which was 29.1 miles an hour, made in the Block Island Race, and she would have come very close to the 30.1 miles an hour made by Shadow III at Miami last Winter.

Marjo is 40 feet long, 8 feet 6 inches breadth, and was designed by Elliot Gardner, who is the designer for the builders. She is practically a duplicate of the Joanna, which was exhibited at the last power-boat exhibition. She is driven by an eight-cylinder, 6¼ by 7¾-inch Duesenberg engine of 275-400 h.p., which turns a Columbian Architect wheel of 26-inch diameter by 34-inch pitch 1,330 r.p.m. Over the measured mile course Marjo has shown an averaged speed of 35.3 miles an hour. She made 32.15 miles up and 38.79 down the course.

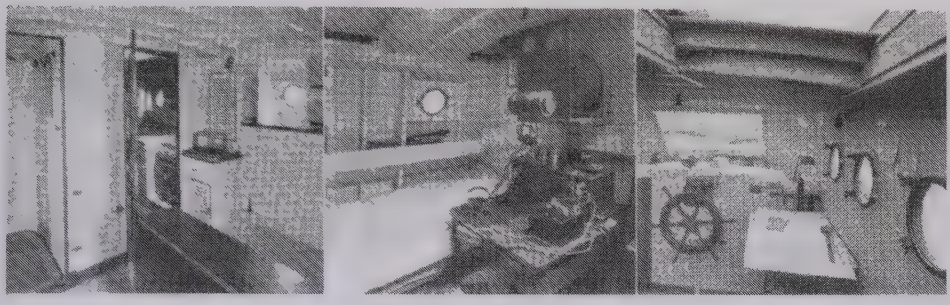
The living quarters are in the forward part of the yacht under the raised deck. They consist of a toilet room in the bow, a good-sized, well-appointed cabin, with two transom berths, lockers, etc., and a galley equipped with a refrigerator, two-burner alcohol stove, sink and provision lockers. The engine is installed under the trunk and has a berth at one side for the engineer. Three 100-gallon tanks are installed for fuel.

Bonita Now S. P. 54

Bonita, built last year for Herman Oelrichs, is now enrolled in the Coast Defense Reserve and is known officially as S. P. 54. This vessel was built by the George Lawley & Son Corporation and is 63 feet long, 12 feet 6 inches breadth and 3 feet 9 inches draught. She is equipped with two eight-cylinder, 6¼ by 7¾-inch Duesenberg engines of 300-400 h.p. each. The yacht was



Marjo, Joseph McAleenan, Owner; 40 Ft. Long, and Equipped With an 8-Cyl. Duesenberg Engine, She Averages 35 M.P.H.



Interior Views of Patrol Boat 54
S. P. 54, Formerly Bonita, Owned by Herman Oelrichs, Showing the Dining Room, Wireless Outfit and Pilothouse

fitted in Brooklyn and, with Mr. Oelrichs and his crew on board, ran through the Sound to Greenport. While at Greenport a report was received that a German submarine was off Montauk Point and S. P. 54 and S. P. 63 both left Greenport and patrolled for hours in a fog.

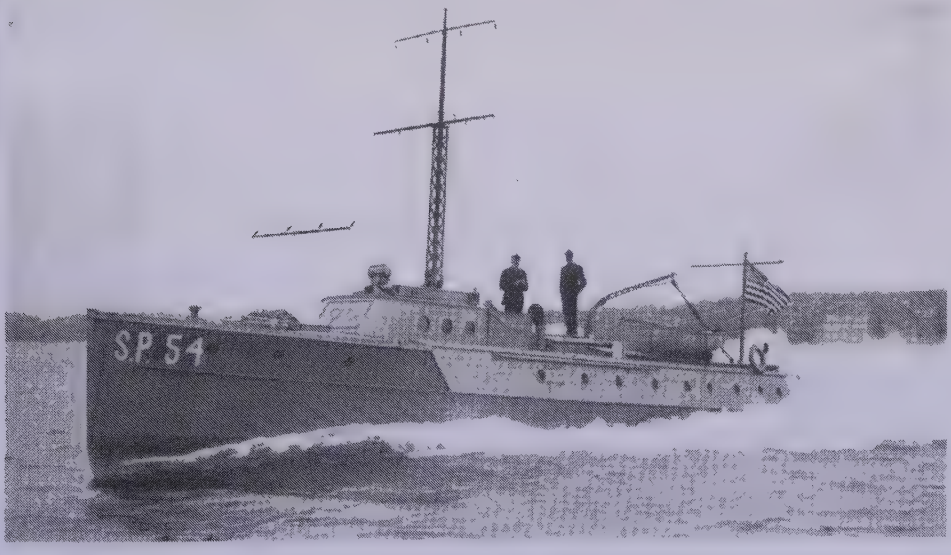
Bonita, on a trial with her engines turning 1,225 r.p.m., each developing approximately 350 h.p., averaged 22.5 nautical miles an hour. The boat is equipped with a powerful wireless outfit and a gyroscope stabilizer.

Runabout for Dr. J. M. Gibbons

Dr. J. M. Gibbons, of the law department of the New York, New Haven and Hartford R. R., will this Summer use a new runabout. Dr. Gibbons has a Summer home at St. Lawrence Park, N. Y., and the new boat will be seen speeding at 32 miles an hour about Alexandria Bay and on the St. Lawrence River. Fiji, his old boat, 59 feet long, is equipped with a Model F-8 Sterling engine. The new boat is being built by Hutchinson Brothers.

This boat represents the typical Thousand Island runabout, the type on which races are attended, short cruising and picnic parties formulated and enjoyed, and suggests the thought that without the power boat the Thousand Islands would still be unpopulated.

Dr. Gibbons's boat has fast lines and will be a pleasurable addition to the fleet of power boats in that district. The engine is installed in the center of the boat with the engine bed 19 inches below the deck, making



S. P. 54, Formerly Bonita, Owned by Herman Oelrichs. Built by Geo. Lawley & Son Corporation, From Designs by Swasey, Raymond & Page, and Equipped With Two 8-Cyl. 6¾-In. x 7¾-In. Duesenberg Engines



Fiji. 59-Foot Runabout. Owned by Dr. J. M. Gibbons; Powered by a New 8-Cyl. Sterling Engine

possible a direct control, with the absence of long levers, bell cranks, etc., which sometimes get out of order. A well-lighted trunk cabin with all accessories and conveniences has been built forward. The cockpit is large and roomy, and has been provided with wicker chairs of great comfort and much ease.

Captain Phelps Gives S. P. 86

Captain John J. Phelps, of Hackensack, N. J., some time ago purchased of the Greenport Basin & Construction Company one of the 60-foot patrol boats which had been built for Russia. Captain Phelps had this boat materially strengthened and fitted to make it serviceable for duty with the Coast Defense fleet, and then turned it over to the Navy Department. The boat was originally named Perfecto, but now is known as S. P. 86.

S. P. 86 is equipped with two eight-cylinder Duesenberg engines of 400 h.p. each. She has Columbian Ailsa Craig propellers with 27-inch diameter and 34-inch pitch.



Osprey II, Niagara 32-Foot Runabout, Built For J. Harvey Ladew

and these, turned at 1,225 r.p.m., drove the yacht at the rate of 30.5 knots on her trials.

Osprey II, Runabout for J. Harvey Ladew

J. Harvey Ladew, a member of the New York Y. C., who formerly owned the steam yacht Columbia in which he made a tour around the world, has recently had built a 32-foot power boat of the V-bottom type which he has named Osprey II and which he will use at his Osprey Island Camp on Raquette Lake. This boat was built by the Niagara Motor Boat Company and is a type of runabout that is growing in popularity. Osprey II is fitted with a new Niagara patented windshield, which can be folded down in front of the bulkhead and allow a free and unobstructed passage to the forward deck. Formerly it was necessary to step around this windshield or over it. Other purchasers of this type of boat are Percy A. Rockefeller and Robert J. Collier.



S. P. 86, Formerly Perfecto, Presented to Navy by Captain John J. Phelps; 60 Ft. Long, She Makes 30.5 Knots With Two Duesenberg Engines

How Warships Are Named

By Walter Scott Meriwether

THE law requires that all first class battleships "shall be named for States and shall not be named for any city, place or person until the names of the States have been exhausted." Secretary Daniels's recent order assigning the names of New Mexico, California, Tennessee, Mississippi, and Idaho to the five superdreadnoughts now under construction, completely exhausts the list of unused names, and in selecting names for the five battle cruisers, authorized by the last Congress, recourse was had to names which never should have disappeared from the Navy register, these being Constitution, Constellation, Saratoga, Ranger and Lexington. The famous old frigates Constitution and Constellation, now preserved as relics of the wooden fleets of a century ago, will in future be known as the "Old Constitution" and the "Old Constellation". The present Saratoga was formerly the New York, the armored cruiser which served as Admiral Sampson's flagship in the Spanish-American war. She must now be renamed again and the name Rochester has been suggested. It will also be necessary to find another name for the old gunboat Ranger. There is no Lexington on the Navy list.

Under a previous act of Congress, armored cruisers were permitted to take the names of States, but with a few exceptions all of our armored cruisers which formerly bore State names have been renamed; the old ones being given to the newer dreadnoughts.

The lawmakers who enacted the bill making it mandatory to bestow the names of States upon ships of the first line were doubtless wise in their generation. The Navy needed to be popularized, and this was a direct way to that end. The same law provided that the names of our distinguished naval officers be perpetuated in destroyers, a seeming anomaly, but appropriate from the viewpoint that the more important vessels represent the nation and that the names we honor have their place in supporting and serving the larger ships. Still one cannot help thinking that such names as Perry, Lawrence, Bainbridge, Decatur, and Farragut are inappropriate when given to destroyers—"stripped hulls slinking through the gloom." How much more appropriate would be Indian names—Apache, Sioux, Pawnee!

It is probably not generally known that the nomenclature as regards the States represented by warship construction is in the proportion of about one-half Indian, one-third English, one-ninth Spanish and one-twenty-second French. The State names of Indian origin are: Massachusetts, Connecticut, Alabama, Mississippi, Kentucky, Tennessee, Ohio, Michigan, Wisconsin, Iowa, North Dakota, Idaho, Wyoming, Utah, Oregon, and Alaska. Those of French origin are: Vermont and Louisiana. Those derived from the English are: Maine, New Hampshire, Rhode Island, Pennsylvania, Maryland, Delaware, West Virginia, New York, New Jersey, Virginia, North Carolina, South Carolina, Georgia and Washington. From the Spanish: Florida, Colorado, New Mexico, California, and Nevada. Indian and French: Illinois. Arizona is of unknown origin.

In foreign navies the names of old ships are always perpetuated. In the British Navy are names of ships that drove back the Spanish Armada. We have our own glorious Navy history, but with the exception of the



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Superdreadnought Utah, 21,825 Tons. Length 510 Ft., Breadth 88 Ft. 2 In., Draught 28 Ft. 6 In.; Driven by Four Screw Turbines; Speed 21.04 Knots. Armament Ten 12-In. and Sixteen 5-In. Guns

Kearsarge we have not yet perpetuated in steel the names of the old wooden hulls of which we should be so justly proud.

In her naval nomenclature Great Britain employs many names which savor of the ages when mere names were supposed to frighten, such, for instance, as Colossus, Hercules, Implacable, Inflexible, Invincible, Irresistible, Powerful, Terrible, Revenge, Goliath.

Of the German Navy it may be said that if imposing names won victories the fleets of the Kaiser would sweep the seas. For under the German flag are the Kaiser Wilhelm der Grosse, Friedrich der Grosse, Kurfurst Friedrich Wilhelm, and numerous others whose names suggest might and success.

The representation of each State is as follows:

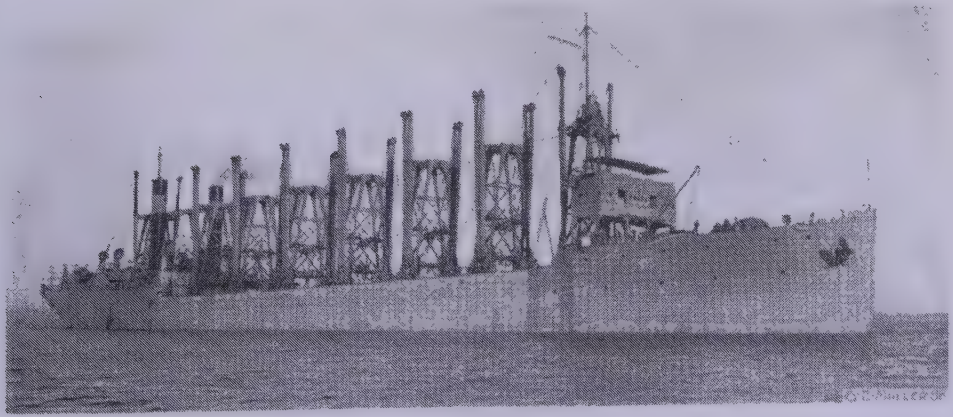
	Tons
ALABAMA, battleship	11,552
Birmingham, scout criuser	3,750
Montgomery, cruiser	2,072
	17,374
ARKANSAS, superdreadnought	26,000
Ozark, monitor	3,225
	29,225
ARIZONA, superdreadnought	31,400
CALIFORNIA, superdreadnought	32,000
San Diego, armored cruiser (ex-California)	13,680
Sacramento, gunboat	1,425
San Francisco, mine layer	4,083
Monterey, monitor	4,000
	55,188
COLORADO, superdreadnought (aut'ized).	32,600
Denver, cruiser	3,200
Pueblo, armored cruiser	13,680
	49,480
CONNECTICUT, battleship	16,000
DELAWARE, dreadnought	20,000
Wilmington, gunboat	1,392
	21,392
FLORIDA, superdreadnought	21,825
Tallahassee, monitor	3,225
	25,050
GEORGIA, battleship	14,948
IDAHO, superdreadnought (ex-Idaho, sold to Greece)	32,000
ILLINOIS, battleship	14,552
Chicago, cruiser	4,500
	19,052
INDIANA, battleship	10,288
IOWA, battleship	11,346
Des Moines, cruiser	3,200
Dubuque, gunboat	1,085
	15,631
KANSAS, battleship	16,000
KENTUCKY, battleship	11,520
Paducah, gunboat	1,085
	12,605
LOUISIANA, battleship	16,000
New Orleans, cruiser	3,430
	19,430
MAINE, battleship	13,500
Castine, gunboat	1,177
Machias, gunboat	1,177
	15,854
MARYLAND, superdreadnought (aut'ized).	32,600
Annapolis, gunboat	1,010
Baltimore, cruiser	4,413
Frederick, armored cruiser	13,680
	51,703
MASSACHUSETTS, battleship	10,288
Boston, cruiser	3,000
Marblehead, cruiser	2,072
Salem, scout cruiser	3,750
	19,110
MICHIGAN, dreadnought	16,000



Armored Cruiser Pittsburg, 13,680 Tons, Formerly Pennsylvania. Length 502 Ft., Breadth 69 Ft. 6 In., Draught 24 Ft. 1 In., Speed 22.44 Knots. Armament Four 8-In. and Fourteen 6-In. Guns

	Tons
MINNESOTA, battleship	16,000
Minneapolis, commerce destroyer	7,350
	23,350
MISSISSIPPI, superdreadnought	32,000
(ex-Mississippi, sold to Greece)	
Vicksburg, gunboat	1,010
	33,010
MISSOURI, battleship	12,500
St. Louis, protected cruiser	9,700
	22,200
MONTANA, armored cruiser	14,500
Helena, gunboat	1,392
	15,892
NEBRASKA, battleship	14,948
NEVADA, superdreadnought	27,500
Tonopah, monitor	3,225
	30,725
NEW HAMPSHIRE, battleship	16,000
Kearsarge, battleship	11,520
	27,520
NEW JERSEY, battleship	14,948
Princeton, gunboat	1,010
	15,958
NEW MEXICO, superdreadnought	32,000
NEW YORK, superdreadnought	27,000
Brooklyn, armored cruiser	9,215
Saratoga, armored cruiser	8,150
Albany, protected cruiser	3,430
Buffalo, transport	5,000
	52,795
NORTH CAROLINA, superdreadnought	
(authorized)	32,600
North Carolina, armored cruiser	14,600
Raleigh, cruiser	3,183
	50,383
NORTH DAKOTA, dreadnought	20,000
OHIO, battleship	12,500
Cincinnati, cruiser	3,183
Cleveland, cruiser	3,183
Marietta, gunboat	990
	19,856

	Tons
OKLAHOMA, superdreadnought	27,500
OREGON, battleship	10,288
PENNSYLVANIA, superdreadnought	31,400
Chester, scout cruiser	3,750
Pittsburg, armored cruiser	13,680
	48,830
RHODE ISLAND, battleship	14,948
Newport, gunboat	1,010
	15,958
SOUTH CAROLINA, dreadnought	16,000
Charleston, protected cruiser	9,700
	25,700
SOUTH DAKOTA, armored cruiser	13,680
TENNESSEE, superdreadnought	32,000
Chattanooga, cruiser	3,200
Nashville, gunboat	1,371
	36,571
TEXAS, superdreadnought	27,000
Galveston, cruiser	3,200
	30,200
UTAH, superdreadnought	21,825
VERMONT, battleship	16,000
VIRGINIA, battleship	14,948
Yorktown, gunboat	1,710
	16,658
WASHINGTON, superdreadnought	
(authorized)	32,600
Olympia, armored cruiser	5,865
Tacoma, cruiser	3,200
Seattle, armored cruiser	14,500
	56,165
WEST VIRGINIA, superdreadnought	
(authorized)	32,600
Huntington, armored cruiser	13,680
Wheeling, gunboat	990
	47,270
WISCONSIN, battleship	11,552
WYOMING, superdreadnought	26,000
Cheyenne, monitor	3,225
	29,225



Jupiter, U. S. S. Collier Which Recently Arrived at a Port in France With Grain and Supplies. Driven by Electro-Turbine Engines. Length 542 Ft., Breadth 65 Ft., Depth 36 Ft. 8 In., Draught 27 Ft. 5 In. Displacement 19,360 Tons

Ship-Building Gets a Big Boom

CONGRESS has appropriated $7,000,000,000 just to start the war with. If the war really gets going, and if we wait long enough many more billions will be needed to carry it through to a successful end. To raise the amount already called for bonds are to be issued for a part of the amount and the rest is to be raised by direct taxation. Appeals are made to the patriotism of the citizen of the United States to help in this war and everyone can do his bit. All cannot go to the fighting front but all are not needed for this purpose. A big army is to be sent to fight and the Navy and all the men in the Navy are to help on the water, but for everyone who goes to fight several must serve at home, because it is necessary that the fighting men shall be fed and clothed. They must also have munitions with which to fight and they must have thousands of things that the lay mind knows nothing about. It is necessary to keep all the factories going to their utmost capacity to furnish a big army with necessaries and it is necessary, too, to have huge fleets of vessels to carry all the supplies across the ocean to the men who are fighting for those at home.

The war has already lasted nearly three years and in that time the United States of America has grown to be the most powerful country in the world. It is the banker of the world and is now helping to finance this huge war. It has lent millions already to its allies to help them carry on the war. It has grown to be the biggest commercial country in the world. Its manufactures are sent all over the world and its exports have grown to enormous proportions. Now this war is going to make this country the leading maritime nation of the world. The German submarines have been sinking so many of the British merchantmen that it has become necessary to build fleets of cargo-carrying vessels that the Allies may be supplied with food and with other necessaries that are furnished by this country, and in order to carry the output of the big manufacturing plants of this country to foreign countries.

The plan now is to build 3,000,000 tons of steel shipping in the next eighteen months and these vessels, too, in addition to many wooden vessels each of 3,000 tons displacement. All this means that the maritime interests of this country are to have years of prosperity such as they never experienced before.

Seven billion dollars are to be spent in this war. This does not mean that these seven billion dollars are to be taken out of the country. On the contrary, nearly all of it will be spent right at home. It will be spent so that everyone can get some of it. Everyone who wants work will be able to get it, for there is a scarcity of labor and when the men are taken for the Army it will be still more scarce. The Government has borrowed the money and issued to the people from whom it has borrowed bonds, the finest security in the world. It is paying 3½% per annum interest on these bonds, furnishing a fine investment for the thrifty. There is no doubt, too, that after the war is over those bonds will be at a premium because they have the backing of the United States.

It would seem, then, that there is no room for the pessimist as far as this country is concerned. In fact, every man, woman and child should be an optimist of the most brilliant kind. The prosperity that has come to this country in the past few years has come to last. Every manufacturer will be busy, every factory will be run to the limit of its output, and in the years to come everyone will be prosperous.

There never were such times in the maritime world as now. Shipping men in the past few years have made fortunes. They will make more in the future. The demand for vessels of all kinds is so great that new companies are being organized every day to build both wooden and steel vessels, and the trouble will be to find the men to do the work.

Realizing that the scarcity of ships was increasing with alarming rapidity, the Federal Shipping Board planned to have built one thousand wooden steamers of 3,000 tons each and Uncle Sam was to be the capitalist to finance the plan. There was some bungling from the start. Many small shipbuilders secured contracts to build a few of these vessels, but it was not until Major-General Goethals was put in charge of the big building scheme that things began to hum. It did not take General Goethals long to find out that to build one thousand wooden vessels was an impossibility. He found that it was impossible to obtain the material necessary for this work and he at once started in on something bigger and more progressive. Now he is going to build steel vessels and they will be turned out in quantities through modern, up-to-date standardized methods.

The United States Shipping Board was organized on January 30th last to promote shipping in this country. The increasing demand for vessels, the high rates of freights and the losses through the German submarines showed to some who were far-sighted that ship-building had to be stimulated and interests in shipping promoted. The original board was William Denman, of San Francisco, an admiralty lawyer; Bernard N. Baker, of New York, former President of the Atlantic Transport Line; John A. McDonald, of New York, who was in the steamship business; John Barber White, of Kansas City, who is in the lumber business, and Theodore Brent, a railroad man of New Orleans. Soon after its organization Mr. Baker resigned and the Board lost its only really practical shipping member.

This Board is a peculiar one. It seems to be responsible to no one or to no department of the Government. To build a fleet of cargo-carrying vessels this Board organized the United States Shipping Board Emergency Fleet Corporation, of which Uncle Sam is the backer to the extent of very many millions of dollars. Some enthusiasts who had more energy than good judgment at once advocated that one thousand wooden vessels of 3,000 tons each should be built and, without stopping to investigate how this could be done, the scheme was made public but no designs were made for such boats. Contracts were placed with some builders and as with the 110-foot submarine chasers of the Navy Department, many concerns with only a piece of land and a keg of nails as a plant tried to obtain orders to build. These mushroom concerns figured that if they could get orders

from the Shipping Board they could easily dispose of them to reputable shipbuilders and share in the profits. They overlooked the fact that every shipyard in the country has all the work it can tackle and that it will be a long time before work in the shops is slack.

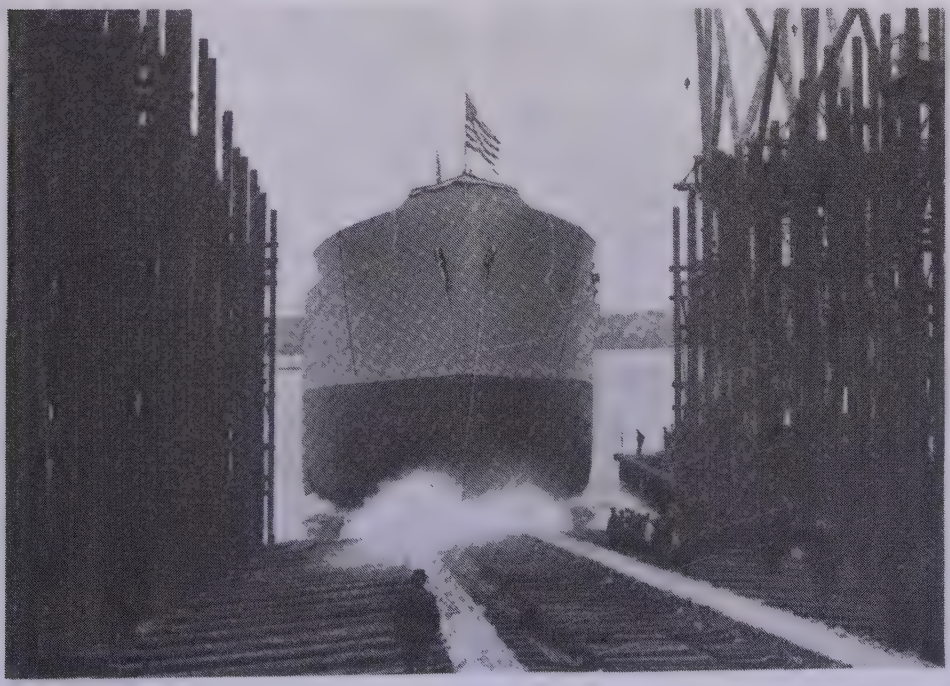
Just why Mr. Denman should have been selected as the head of the Board is past understanding. Mr. Denman has for years been an admiralty lawyer practicing in San Francisco, but an admiralty lawyer has to puzzle out the legal problems that arise in the maritime world and does not understand more than in a cursory way anything about construction. One of Mr. Denman's largest clients was the largest wooden shipbuilding yard on San Francisco Bay and among other clients are large timber men. He has litigated about wooden vessels for years and perhaps that may account for his fondness for wood.

A little more than three weeks after the Shipping Board came into existence it decided to build an Armada of wooden vessels, one thousand of 3,000 tons each, and this scheme came through the suggestions of F. A. Eustis, who is a brother of W. E. C. Eustis, a prominent member of the Eastern and other yacht clubs, and F. Huntington Clark. Messrs. Eustis and Clark are mining engineers and their cooperation in the building of the fleet makes another queer combination—a lawyer at the head and mining engineers as advisors.

With a loud flourish of trumpets it was then announced to the world through the daily press that the Shipping Board, backed by the United States, was to solve the submarine problem by building in the course of a comparatively few months this huge fleet of cargo-carriers. All the decadent glories of the old wooden shipbuilding yards were to be revived. The sounds of the adze, the saw and the hammer would ring out in all the New England yards which years ago had built the famous American clipper ship, and the sounds were to travel down the coast to the Gulf and then up the Pacific Coast to Seattle.

Owners of yards besieged the members of the Shipping Board and their subordinates. New companies were drawn, organized on paper and efforts made to obtain some lucrative contracts. Designers were busy, too, and the Board was flooded with plans.

Some funny stories came from the headquarters of the Board at Washington. One builder, who figured that he could handle two of the vessels, applied for a contract and was told that he must build twenty. It was useless for him to explain that he had not the plant to turn out twenty vessels. There was plenty of land space adjoining his yard and he was told he could set up twenty vessels on that land as easily as he could set up two on the stocks, but how he was to launch from the land he could not get explained.



Scandinavia, First Ship of Standardized Steel Fleet, Recently Launched at Staten Island at Yards of Standard Shipbuilding Corporation. Launched Six Weeks After Laying the Keel

The scheme to build one thousand cargo-carrying vessels of about 3,000 tons each looked like a good one. To run the submarine blockade it is better to have a fleet of small craft rather than a few large vessels, because the loss of a few will not make much material difference. It was putting into practice the old adage about "not putting all your eggs into one basket." On paper there were to be 2,000,000 tonnage built by November, 1918, and 4,000,000 more by the following November.

To put this great scheme into execution Major-General George W. Goethals was pressed into the service. That was really brilliant and the wisest move that could have been made in order to get a fleet of cargo-carriers, but it spelled doom for the wooden ship plans. General Goethals studied things from a practical viewpoint. He soon found out that it would require the services of an army of between one and two hundred thousand practical shipwrights to build the fleet of wooden craft, and that offered one insurmountable problem. Then when he investigated further he found that of the vast amount of material being offered there was none, he very aptly put it in this way: "When it is considered that birds are still nesting in the trees from which the great wooden fleet was to be made, and it was proposed to construct from them ships capable of making from 10 to 11 knots—and more when in the zone in which existed dangers from torpedoes—it is seen how hopeless the task appears."

After looking over the situation General Goethals visited James A. Farrell, President of the United Steel Corporation, and after talking things over Mr. Farrell assured General Goethals that the full resources of the corporation's mills would be at the command of the Shipping Board. Then General Goethals began to see a way clear to speed up the construction of steel ships.

At the annual dinner of members of the American Iron and Steel Institute, the builder of the Panama Canal told the steel men of his plans and aroused an immense amount of enthusiasm. He told the steel men that Congress would appropriate the necessary money to build these ships and asked for their cooperation.

Now what has happened? Congress is to appropriate $750,000,000 and combined steel interests are to turn out 3,000,000 tons of shipping in eighteen months. The vessels are to be of 5,000 tons each. Their construction will revolutionize ship-building in this country. The keels, frames, and other parts will be turned out in quantities at the steel mills, the plates will be cut, shaped and drilled, and then the parts will be sent to the yards to be set up just as the Elco Company built the five hundred and fifty patrol boats for the British. It is standardization again, and time, labor and money will be saved in the building of the fleet. In the past the many parts of the vessel have been made at the shipbuilding yards, with the possible exception of such heavy metal pieces as the stem and rudder post. Each vessel has been built from a separate set of plans. Only occasionally have two or three of the same model been built at the same time, but now General Goethals has the cooperation of makers of machinery, those who make chains, wire cable, anchors, and everything that goes into the making of a complete ship.

The result of General Goethal's conferences with the steel men is that three of the largest companies in the world,—the American Bridge Company, a subsidiary of the United States Steel Corporation; the Lackawanna

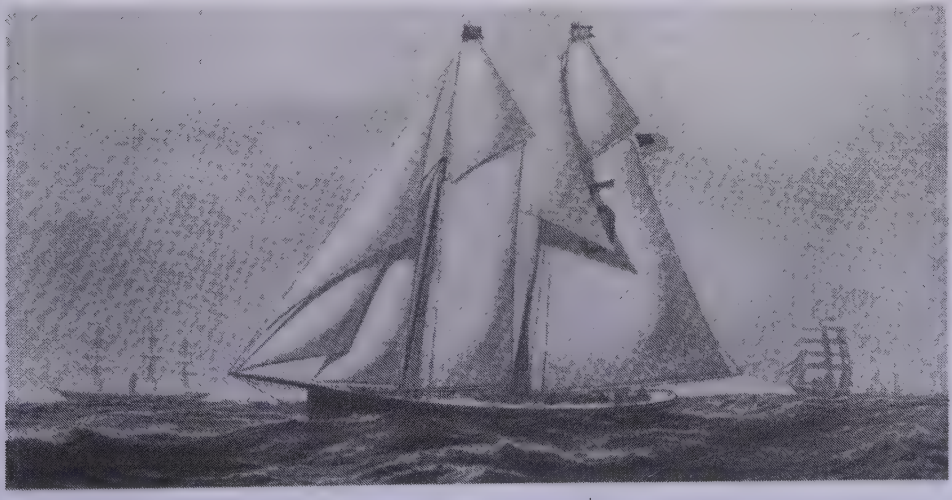


Dirigo, First Iron Ship Built in America, Recently Sunk by a German Submarine. Built in 1894 by Arthur Sewall & Co., at Bath, Me. Gross Tonnage 3,004. **(See Sail Plan on Page 493)**

Steel & Iron Company, and the Bethlehem Steel Company—are to start work at once on standardized steel vessels of 5,000 tons each. The American Bridge Company has secured a tract of land on Newark Bay and the shops are now being erected. The vessels are to be fabricated out of structural steel and they will be built just as a big skyscraper or a bridge is built. All the parts will be made in quantities at the steel mills. The tensile strength of the steel will be 50,000 lb which is 10,000 lb less than Lloyd's requirements, but speed is the essential thing just now and everything is to be done to expedite the building of the vessels. Later vessels of 8,000 tons and even 15,000 tons are to be built. The latter will be 500 feet long and are to make 14 knots. In type these vessels will be somewhat similar to the big tankers. The machinery will be installed near the stern and the hull will be divided into many compartments, three of which may be blown out and the vessel still float. It will be six months before the first of these vessels is ready for delivery, but after that they will be delivered very fast.

General Goethals has accepted the proposals of the United States Steel Corporation and the Lackawanna Steel & Iron Company to turn out by fabrication processes 3,000,000 tons of steel shipping in eighteen months. He has also placed contracts with the Sloan Ship Yards Corporation, Seattle, for sixteen wooden vessels; Gray's Harbor Motor Ship Construction Corporation, Aberdeen, Wash., for four wooden vessels; the Coasts Shipbuilding Company, Portland, for four wooden vessels; Edward F. Terry & Henry L. Brittain, Moss Point, Miss., for twenty composite vessels, and with the Skinner Eddy Corporation, Seattle, Wash., for six steel vessels. Contracts have also been made with other builders and it is expected that perhaps two hundred wooden vessels will be built and that the rest of this huge fleet of cargo-carriers will be of steel.

In the meantime many of the yacht designers have turned their attention to the commercial side. They have designed vessels, found out where they can be built, and have made satisfactory contracts with the Government. Among those active in this work are Tams, Lemoine & Crane, Cox & Stevens, Gielow & Orr, and William Gardner & Co. At the same time they are not neglecting their yacht work. Each firm of designers is hard at work designing yachts which when the war ends, are to be built to take the places of those which have been turned over to the Government. These are not to be built now, because it would be very difficult to find yards where such work could be done, as everything is being sacrificed to commercial and Government work; but when the war does end there will be a big boom in yacht-building. Vessels of all sizes and types will be ordered and builders, engine builders, chandlers, outfitters and all who make any parts that go to make a perfect yacht, will have all the business that they can attend to for a long time to come. This will apply to the big concerns and to the smaller ones alike.



Pilot Boat No. 5, Plans of Which Were Published in The Rudder, March, 1917, Page 181. A Type of Vessel Famous for Seaworthiness

National Nautical Schools

AN unusual and important call to service has been addressed to American seafaring men by the National Government, through the United States Shipping Board, the newly created executive branch of the governmental machinery that has in charge the building up of the new war service Merchant Marine.

The Government wants the services of every man, now free to enroll, who can qualify as a master or mate or has a fundamental knowledge of engines or engine-room duties.

In a few months it will need 10,000 officers for the one thousand cargo-ships now being constructed for the Shipping Board. These ships are to be the nucleus of a new nationalized fleet that eventually will carry the flag to every quarter of the globe, and put the country where it belongs among the maritime nations of the earth.

This fleet is actually under construction, and the fact that the construction work has been entrusted to Major-General George W. Goethals, the man who dug the Panama Canal after it had broken the purse of its French backers and the hearts of a long line of trained engineers, is evidence that the job will be completed as planned.

The Government's most pressing need for its new fleet, in fact, is not ships, for those are assured, but men. There are not 10,000 merchant officers in this country, nor yet 5,000. But there is the raw material for officers at every American port.

Americans are notably adaptable, and on this fact the Government bases its faith that the officers needed to supplement those already in service can and will be found among the hosts of clean, dependable, intelligent men, not enrolled in the Navy, who know something of the water. In every port of the United States one sees such men, on board craft of various sorts,—on tugs, ferry-boats, passenger steamers plying harbors, lakes and sounds; in the crews of larger, coastwise steamers, and on sailing vessels, both coasters and fishermen.

Most of them occupy modest positions. A good many have never dreamed of command on an ocean-going ship, or of a berth as a first officer or engineer on such a ship. They have not enough faith in themselves, perhaps, for want of encouragement, to believe they could make good in such a position of responsibility.

But Uncle Sam thinks they can make good. He is telling them so, by every means possible, as fast as he learns where they may be reached. In order to impress on them their value to their country at this time, and the welcome they will receive in the new Merchant Marine, he has established a recruiting service for the Shipping Board.

At the head of this service has been placed one of the keenest executives interested in the nautical game in America, Henry Howard, of Boston, who is known personally to many yachtsmen, and by reputation to many more, as a tireless worker for the sport. A few years ago he took the Eastern Y. C. in hand and made it a strong racing organization. Mr. Howard is also known in another field, that of business efficiency. He holds an important executive position in one of the largest chemical corporations in the country, and in that connection is responsible for a large share of the country's output of acids, one of the essential raw materials for munitions. He is a member of the Committee on Acids of the Council of National Defense, and in that direction is doing important work for the advancement of the nation's preparations for war in the field.

Mr. Howard a few weeks ago advanced to the Shipping Board a comprehensive program for utilizing the country's splendid material for merchant officers. Know-



The First Class to Study Navigation, at the Expense of the U. S. Government, at the U. S. Shipping Board's Nautical School at Harvard

ing the yachting field thoroughly, and having a perfect knowledge of the coast, and conditions in maritime communities, he told the Board that there were enough men of the best type available to officer the new ships being built by General Goethals, and all others now building that the Government may take over.

The Board heard Mr. Howard's statement with receptive interest, authorized him to go ahead, and made him Director of Recruiting for the Shipping Board, with full powers to enlist and train the 10,000 officers that the Board ultimately will need.

Having secured authority to push this great work, Mr. Howard cast about him for means to spread the gospel of the new Merchant Marine. The plan called for wide publicity, and to secure that the service of a man familiar with methods of disseminating news and special information through the press must be secured.

Mr. Howard knew the man he wanted, and named Winfield M. Thompson, of the Boston *Globe* staff, who has been for many years a member of THE RUDDER staff also, as his chief assistant, with the title of Director of Publicity for the new recruiting service. Mr. Howard and Mr. Thompson were in Washington on June 1st for consultation with the Shipping Board, and on that day were sworn into office.

Since entering office these two new officials, taken from private life, have made a widespread appeal to recruits through the daily press and class papers read by the type of man they wish to reach.

THE RUDDER gladly places at their disposal as much of its space as they can use, to carry their message to its readers.

Already a large number of recruits have come forward for positions as masters, mates and engineers, sending their names to Mr. Howard's headquarters, which are at the Custom House, Boston. As fast as names come in, they are filed, and each applicant, if he has had seagoing experience of three years, is sent information on the plan to be followed in fitting applicants for service.

The Government does not ask the applicant to plunge unprepared into the work reserved for him. It is ready with a practical means of aiding him to fit himself first for the new job. These means consist of schooling and training, the expense of which the Government takes upon itself. Men between the ages of nineteen and fifty may take the training.

A system of training was outlined in Mr. Howard's original proposal to the Government, and it is now being worked out at various points on the Atlantic Coast, in-so-far as it applies to candidates for places as watch officers. It is planned to open schools for engineer officers later in the year, but the plan for them has not yet been adopted.

Each applicant for a place as a watch officer is informed that if he has had proper seagoing experience he will be given a course in navigation under skilled instructors, at any one of the following points which he may designate: Cambridge, Mass. (Harvard College); Machias, Rockland, Boothbay Harbor, or Portland, Me.; New Bedford, Mass., and Greenport, Long Island. Later schools will be established farther South.

The teaching staff is under the direction of Dean Alfred E. Burton, Professor of Topographical Engineering at the Massachusetts Institute of Technology, who is a practical navigator, and a former member of the Coast and Geodetic Survey. Beginning their work with classroom lessons, the students are soon taken afloat, on yachts or other boats provided by the Government, and are given opportunity to pursue their work under actual conditions required for finding a ship's position at sea with the use of instruments.

As soon as the students are ready for their examination, they will be examined by representatives of the Steamboat Inspection Service, and under the rules governing the granting of papers for officers of ocean-going vessels, will be given their certificates.

Unless fully qualified by seafaring experience to take a position of full responsibility at once, they will be placed for training at sea as junior officers on coastwise vessels, or those in the South American trade, and will go on pay, probably at $75 a month, for the period that they are to serve in this way. The ships to which they are assigned will carry their full complement of officers as usual, and the new juniors will stand watches with them, thus gradually working into the way of taking charge of the deck on their own account.



H. W. Geromanus, Dean of Engineering School; Colonel and Prof. G. L. Hosmer, Harvard, Instructors



Melvin H. Fowler, of Chelsea, Mass., First Student in the School of Navigation

As the new ships come out—and the first of them will be overboard inside of six months—officers for them will be chosen in part from among the men thus trained. A man will then go on full pay for his grade at the going war rate for the transatlantic service. At present that totals, with war bonus, about $350 a month for captains, $250 a month for first officers, and in proportion for second and third mates.

It will be seen, therefore, that Uncle Sam offers a lavish inducement to men with a knowledge of seagoing to come forward and help break the power of the predatory Germans on the sea. At this writing it appears that this power is diminishing; but the U. S. Government is placing no reliance on chance, and is preparing for eventualities on a scale aimed to nullify the submarine menace, however great it may grow to be. There is no doubt in the minds of men conversant with the plans of the Shipping Board that this can be done in the way that Uncle Sam is starting out to do it. His plan, in essence, is to put his cargoes in so many bottoms that only a fraction of them can be sunk by the German submarines at their best. The rest will get through, with the consequent assurance of a steady stream of supplies for the Allies and for our own gallant boys in France. That, as the Government sees the situation, means the ultimate wearing down of the Hun, for he has himself said that his reliance is the submarine. Blockaded, with his food supply limited and steadily diminishing, with his rolling stock worn out or tied up for want of lubricants, with discontent growing among his deluded subjects, who have been fed upon false reports of victories, the Kaiser eventually will find himself spent by mere attrition of his forces.

Therefore, says the Shipping Board, the man who steers a cargo of supplies through the submarine zone is as mighty as an army with banners. He is indeed the army, for he has the Army's stomach in his keeping. Therefore, the Government expects every man who feels in his heart that he can do something for his country on the sea, to drop his oar or wheel or monkey wrench and come forward, sending his name to Henry Howard, Custom House, Boston, as fast as wire or mail can carry it.

When the war is over, according to shipping experts, the United States will be perforce one of the leading shipbuilding, as well as one of the leading ship-owning, nations of the world. The logic of the situation is all in that direction. For these reasons the war positions which Uncle Sam now offers his sailor sons may become permanent ones. The flag will fly on the sea in the next generation as it has never flown before. Confidence of this is in the air at Washington, and it seems the rest of the country will not be long in feeling it, in like degree.

In the past two months there has been much discussion in the press on the merits of what appeared to be a controversy between Shipping Board officials on the merits of wooden and steel ships for the new blockade-running fleet. Chairman William Denman, of the Shipping Board, favored the building of as many wooden ships as possible, for immediate use. General Goethals, speaking at a dinner in New York, remarked that the birds were still nesting in the trees that would go into wooden ships. He emphasized the limitations on wooden ship-building, through want of material, yards and labor. Others pointed out that many of the famous New England yards had fallen into disuse when the war began. The old race of shipwrights had died. Their sons did not follow the trade of their fathers.

This was all true, yet it did not alter the fact that a certain number of wooden ships could be built, and several have been contracted for. While not as permanent as steel vessels, these wooden ships show a sturdy design, and one that indicates years of service. They are about 3,000 tons register, and not unlike the old wooden revenue cutters, which did service on the American coasts for generations, and even braved the pressure of Arctic ice, without straining or leaking. A considerable number of these vessels are taking shape in the New England yards and elsewhere. The constructor in charge of the work in New England is not unknown to the yachting fraternity, being William H. Hand, Jr., of New Bedford, who developed the now well-known V-bottom type of power boat. Mr. Hand has faith in the wooden ship as a means to an end. "When you want a club to beat off a mad dog with, you are not particular what kind of a club it is, if it will do the work," says Mr. Hand privately, and in that remark lies the logic of the wooden ship.

The German ships, which are being fitted out for service by the Shipping Board, present a different angle of the program. Many of them are passenger vessels, with no cargo capacity worth counting. These will be used as troopships, without much doubt, and though they aggregate 600,000 tons register, their acquisition does not lessen the need of speedy and effective action, such as is now going on, for the building and manning of Uncle Sam's emergency fleet.



Psyche, James Deering, Owner; 45 Ft. Long, 10 Ft. Breadth; Built by the Gas Engine & Power Company; Engines, Two Speedways, 150 H.P. Each; Speed 20 M.P.H.

City Island

By W. P. Stephens

LOOKING back over a period of nearly forty years, it is evident today that the establishment of a local club by half-a-dozen enthusiastic boat sailors at Larchmont in 1880, an event of no importance whatever at the time, marks the beginning of the ebb of yachting on New York Bay and the slack that preceded the tremendous flood of the sport on Long Island Sound. At that time New York Bay was the great center of American yachting, with clubs along the Staten Island and Bay Ridge shores, at Communipaw over in Jersey, and along both the North and the East rivers. East of Hell Gate there was one club, the Knickerbocker, a very lively organization of young Corinthians with a station at Port Morris; there was also the New Bedford Y. C. and the Providence Y. C. (later the Rhode Island), and there were possibly some small local clubs long since forgotten along the shores of the Sound. The Seawanhaka Y. C., organized at Oyster Bay in 1871, had outgrown its birthplace and migrated to Staten Island, adding the qualifying "Corinthian" to its name. Famous as it was as a cruising ground and a way to and from Eastern waters, Long Island Sound was not in itself the home of yachting.

The City Island of those days was almost a *terra incognito* to yachtsmen, with little to attract them by water and difficult of access by land. The new Elevated Railway, with its smoky little locomotives, had replaced the horse-cars as far as the long journey to the Harlem River was concerned, but beyond this point all transit was slow and uncertain. Some time in the sixties, when the great American shipbuilder, John Roach, was still running a small foundry in Goerck Street, on the East Side, and casting lamp-posts and fire-plugs for the city, he took a contract to build a bridge of cast iron, with an arched draw-span also of cast iron, over the Harlem River on the line of Third Avenue. When this bridge was erected the old wooden bridge which it displaced was taken down and re-erected across Pelham Bay, connecting City Island with the main land of Rodmans Neck. On leaving the L Station at 133d Street there was first the draw, which was almost certain to open just as the explorer approached, barring the way for an indefinite time. This barrier passed, there was a hurried sprint for the old station of the N. Y., N. H. & H., which was reached just as the City Island train departed, causing a delay of an hour. When after a tedious journey and many stops the train made Bartow Station, there was still a mud road of some three miles, traversed at irregular intervals by an antiquated stage of the Black Maria type too small to accommodate the crowd of fishermen from the city, much less the yachting pilgrims.

City Island itself was important mainly as a station for the coasting trade, the numerous schooners anchoring in the roads, taking and dropping pilots, and receiving orders from the city. On the Southerly point was the estate of W. F. Belden, a wealthy New Yorker, and anchored off was the steam yacht Yosemite, one of the early iron yachts, built for Mr. Belden by John Roach in 1880, a notable craft in her day. Yachting was represented by the yard of David Carll, devoted largely to commercial work and notable for the fast schooners then owned in Staten Island and carrying oysters from Virginia to New York. The 30-foot sloop Belle was built by Mr. Carll as early as 1859; in 1866 he modeled and built the schooner Vesta, one of the trio in the great ocean race of that year. The Magic, built as a sloop by T. Byerly & Son, in Philadelphia in 1857, was lengthened and rebuilt as a schooner by Mr. Carll in 1869 for Commodore William T. Garner, and in the following year won the honor of first defending the America Cup. In 1871 the big schooner Resolute was built for A. S. Hatch; in 1873 the schooner Calypso, after being burned, was rebuilt as Atalanta for William Astor. The oyster schooner Stephen D. Barnes, built in 1875, was later known as the yacht Vega. The final effort of the Carll yard was the great schooner Ambassadress, built in 1877 for Mr. Astor, a centerboard boat 146 feet over all, 130 feet water-line, 28 feet in breadth and drawing upward of 13 feet. Known derisively as the "Astor House," she was at least notable for her size in those days; in 1881 Mr. Carll altered her to a keel boat. Next to the Carll yard was the boat shop of A. B. Wood, building the rowboats about 15 feet long then used by the Hell Gate pilots, the finer class of rowing boats then popular about New York, and lifeboats for the Government.

About 1877 there came to New York Henry Piepgras, a Danish ship carpenter who had led an adventurous life at sea, a broad-shouldered giant with fists as big as beer kegs. He took up a piece of sandy beach on the Brooklyn shore just below Blackwells Island, locally known as Pottery Beach, and started in as a shipwright in repairing large vessels. One of his ventures in yacht-building was a keel cutter of about 25 feet water-line, a rather wide boat of his own design, for Mr. W. G. Diedrichsen, a compatriot, then living on Staten Island. In 1878 the famous "cutter craze" which revolutionized American yachting broke out in New York, and Mr. Piepgras, who had made a reputation for good work in the repairing of yachts, contracted to build the cutter Muriel, of 40 feet 6 inches water-line by 9 feet 2 inches breadth, designed by John Harvey, for Charles Stillman. Muriel was followed in 1880 by Yolande, a smaller cutter designed by M. Roosevelt Schuyler for himself, and Leila, a diminutive cutter of but 18 feet water-line. In the same year the keel sloop Hesper, of 45 feet water-line, designed by A. Cary Smith for W. H. Forbes, was built, and then followed a number of famous cutters, Oriva, Wenonah, Bedouin and Ileen, with the steam vacht Wanda, all designed by John Harvey. The teak for these yachts, the wood being hardly known in American yacht-building in those days, was obtained in part from the spars of large vessels visiting New York, being replaced by Mr. Piepgras with spars of other woods.

The last yacht built at Pottery Beach was the centerboard cutter Cinderella, designed by A. Cary Smith for

W. E. Iselin in 1886; by this time the little yard was too small, there was no railway, and the boom in yachting which came as the result of the America Cup matches of 1885-6 promised an increase of business for all builders. The Carll yard at City Island was purchased by Mr. Piepgras, his old plant was moved up there, and new machinery for steel construction was installed.

The first important work of the new yard was the construction of the 70-foot Titania, in 1887, from Mr. Burgess's design, for C. Oliver Iselin; in the following year was launched another yacht for the same famous 70-foot Class, Katrina, designed by A. Cary Smith for Messrs. Auchincloss; then followed the schooners Constellation and Quickstep, designed by Burgess, in 1889; all being of steel. There came to City Island last month a schooner from a Canadian port, loaded with lumber and returning with coal; Lasca, designed by Mr. Smith, and built at this yard in 1892 for John E. Brooks, a fine vessel. The passing of Lasca recalls another notable schooner, Sea Fox, designed by her owner, Commodore A: Cass Canfield of the Seawanhaka-Corinthian Y. C., in 1888, and one of the last yachts built of iron. Though sounder today than many steel yachts of half her age, she will soon leave her berth in Jacob's yard to begin life anew as a carrier like Lasca. The regret which every yachtsman must feel at the passing of such noble old sailing yachts is tempered by the thought that they have been appreciated and well cared for; since 1905 Sea Fox has been owned by Dallas B. Pratt, just as Katrina has been owned since 1901 by James B. Ford. Now that sail has given place to the more serviceable and adaptable power, it will be interesting to see whether the same sentiment attaches itself in years to come to the modern craft?



Okee III, Champion N. Y. Y. C. 30-Footer of Last Season

In his purchase of the Carll yard Mr. Piepgras met with hard luck, a prehistoric claim to the beach rights was revived, and he became involved in long and costly litigation before his title was firmly established by a purchase of the claims. In 1901 the yard was purchased by Robert Jacob, a Corinthian yachtsman well known on the Sound, who has since owned it; without previous experience as a builder he has carried on a successful business and built many fine yachts. At the present time there are three yachts ready for launching, Sinco, for H. F. Sinclair; Monon, for Morton F. Plant, and one as yet un-named for L. G. Hamersley. All are of wood, and designed by William H. Hand, Jr.; identical except for 5 feet more length in the first, which is 60 feet over all. The breadth is 10 feet 6 inches, the draught 3 feet, and each carries two eight-cylinder Duesenberg engines. The model is of the V-bottom type developed by Mr. Hand, with plumb stem and vertical V transom.

The yard is a busy place in these days, as Mr. Jacob has five of the new 110-foot submarine chasers on the stocks. Work has been pushed so rapidly that these boats, now planked, are nearer completion than any others in private hands. In 1903 the English sailmakers, Ratsey & Lapthorn, Ltd., established an American branch at City Island, leasing a portion of the Jacob yard and building a large sail loft. The lease having expired, Mr. Jacob has taken the building as a boat shop, two of the yachts just mentioned having been built therein. In order to launch them from what is the second story on the waterside, an elevated ways has been constructed at a steep angle, down to the beach. The older buildings are still used for the steel plant, heavy machinery and larger yachts, but all of the joinerwork and light hull building will be done in the new place.

The boat-building begun by A. B. Wood in the sixties was carried on with the aid of his son, B. F. Wood, through the eighties, the little old shops just South of the Carll yard turning out craft of the highest quality. The first venture in real yacht-building came in 1891, when the 25-footer, Nameless, was built from the design of William Gardner for C. W. Wetmore. Mr. Gardner has always been noted among designers for refinement of form, the fairness and accuracy of his drafting, and his attention to all details of construction, and even in these days he demanded more from the builder in the way of accurate work in the mould loft and thence on in all details of construction than most yards could give. In this first yacht all of his demands were fully met, and in the following year an order was placed with the Woods for the Feiseen, one of the first of the high-speed steam yachts of the class known as express boats; designed by Gardner & Mosher. The construction was novel, elaborate and complicated, very light for the time, but it was so successfully mastered that in the following year Feiseen was followed by a similar yacht, Nada.

The work of the yard changed from this time on from boat to yacht-building. Shears and a punch were needed for the steel frames of the new yachts and as the prices asked were pretty high B. Frank Wood made his own patterns and built a combination machine which worked so satisfactorily that the patterns were sold to a manufacturer. Taking his father's place as the latter retired, he carried on the business until 1910, when he gave place to his son and an associate, the firm being Wood & Mc-

Clure. Many yachts have been built, the majority from Mr. Gardner's designs, and as his requirements have increased they have been fully met. The yard is a very small one, on a high bank with very limited waterfront, and the plant is still housed in the old buildings of the boat-building era supplemented by a chance growth of odd sheds. In looking over the plant, with its haphazard housing and limited amount of small machinery, one is struck with the disparity between the means and the achievements; the yachts, whether of bronze, steel, wood or composite, sail and power alike, being capable of holding their own in comparison with anything on salt or fresh water. When it comes to the really artistic side of designing and building, it is a question whether anything can compare with the joint work of Mr. Gardner and the Woods.

The Winter's work, now nearing completion, includes the fleet of six one-design sloops of the 31-foot Class, designed by Wm. Gardner & Co. These boats are 59 feet 9 inches over all, 38 feet 8 inches water-line, 12 feet breadth and 7 feet 9 inches draught, carrying 1,700 square feet of sail in mainsail and jib. The form is beautifully moulded, with fair sweet curves in every direction. A low trunk gives full headroom over the saloon and the pantry; a separate skylight gives headroom in the after cabin, but it is necessary to "duck" under the deck in passing into or out of the latter. There is a toilet room forward, on the starboard side abreast the galley, and a second w.c. concealed under a locker in the after cabin. The boats have no bowsprits and all steer with tillers. They are of wood throughout, with bent frames and mahogany planking; the floors are of oak, very deep, and with two keel bolts through each, the only metal being the diagonal straps for chain plates and across the decks. The limited space in the main shed made it possible to build but three at a time; Nimbus, owned by J. F. Feder; Grey Dawn, Philip H. Johnson; and Varuna, James B. Ford. The fourth to be named is Georgia, owned by Harry H. Raymond, F. D. M. Strachan and George F. Armstrong. The six sets of frames were got out at the same time, each timber being beveled on the mould loft floor; as the completed boats are run out of the shed a new keel is laid and the six will soon be ready. While five will carry the conventional gaff mainsail, Varuna will try a very interesting experiment with the English "Marconi" rig; a pole mast and triangular mainsail. All of the spars are hollow built by Pigeon, in Boston; Varuna's mast is built with a curve for its entire length, the swing from a straight line being about 30 inches. In shipping the spar the railway officials at first refused to accept it on the ground that it was damaged when offered for shipment. There are two sets of spreaders with shrouds to each. The luff is held to the mast by a bronze track and travelers.

The facilities of the Wood yard were greatly increased a few years ago by the installation of a very fine electric railway, capable of hauling a Cup yacht, but the ground space is too limited for storage or even building on a large scale. A short time since the yard of the Holmes Motor Company, at West Mystic, Conn., was purchased by Wood & McClure, and they will take possession as soon as all contracts are completed at City Island. Though more remote from New York, the new yard is of extensive area, with large modern buildings, deep water, and on the clean open waters of Long Island Sound. The old yard will be continued by B. Frank Wood.

The stretch of low, sandy beach and marsh between the Jacob yard and the upland to the North has at times housed several shops, the oldest being that of G. W. Byles, a small shop and railway. On the North edge of the marsh there was for some years a combination of garbage dump and tumbledown sheds in which yachts were built. This most unpromising and unsavory location was taken in 1910 by H. B. Nevins, who has worked wonders with it. A large area of ground has been added to the original plot, absorbing the old Byles place, a second railway has been laid down, and a large modern shop well equipped with wood-working machinery has been built on the site of the old sheds. In addition to this material plant Mr. Nevins has built up a reputation for good work and reliability. A good deal of laying-up and repair work is done as well as building; the one yacht launched this year was started last season but delayed by the strike, which did so much harm to yacht-building and which, unfortunately, was repeated this year. This is an auxiliary schooner, Saona, designed by Gielow & Orr for C. M. Brooks, of New York, at one time owner of the Gielow cutter Saona, now broken up. Under her original owner, the late A. P. Ketchum, for whom she was built by Wintringham in 1891, the first Saona enjoyed a most exemplary reputation, being hauled into the old Atlantic Basin at Bay Ridge every Saturday afternoon to rest until she was hauled out to her mooring on Monday morning. Mr. Brooks is one of several owners who esteemed this fine little ship and he has honored her in naming the new boat. The latter is 66 feet over all, 46 feet 9 inches water-line, 13 feet 8 inches breadth and draws 9 feet 2 inches; a keel boat with outside lead. Her engine is a two-cylinder four-cycle Palmer, 5 by 6 inches. At the present time the main shop and the sheds as well are fairly overflowing with a fleet of one-design sloops, twenty in all, designed by Wm. Gardner & Co. for the Devon and Southampton yacht clubs;



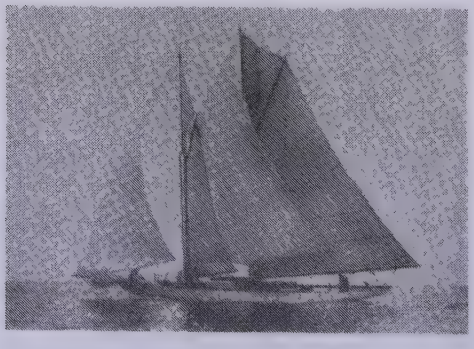
Invader, Champion Class Q Yacht of Great South Bay

handsome little keel craft, 28 feet 6 inches over all, 18 feet 3 inches water-line, 7 feet breadth and 4 feet 3 inches draught, with 360 square feet in mainsail and jib. These boats are built by wholesale, the hulls (keel up) over a last on which they are quickly framed, planked, caulked and smoothed off; the lead keels cast in a batch, the wood keels got out at one time ready for fastening to the hulls, and the long narrow cockpits made separately and slipped into place. The canvas for the decks is unrolled over a hull from a big reel, drawn taut and tacked; the hulls are mounted on special high horses while lead and wood keels are slipped underneath and bolted up. All operations are simplified and systematized to save time and labor.

The large upper floor of the main shop is occupied by W. H. Griffin as a sail loft, the sailmakers, like the yachtsmen and yacht builders, having largely migrated from the city proper. For many years the sail loft of Wilson & Griffin was one of the notable places on South Street, the canvas for many great and small yachts being turned out in the comparatively small lofts reached by long narrow flights of steep stairs hardly better than ladders. The present loft is large, clean, well lighted and comfortably heated. The only survivor of the old days is William H. Griffin, the son of the former member of the firm.

On the hill just North of Nevins's yard is the new sail loft of Ratsey & Lapthorn, Ltd., completed last year, a fine modern building of concrete and sheet steel, three stories and a basement, with a long wharf leading out to deep water. The floors, 51 by 100 feet, are fitted with every convenience for sail-making. Much of the sewing is now done by special machines built to handle heavy materials in large pieces; the work being in some respects superior to hand-sewing, while of course more expeditious and less expensive.

After various vicissitudes and changes of ownership the old Robertson yard has been for some years in the hands of Kyle & Purdy, Inc., building in both wood and metal. Early in the Winter there was launched the Gadfly, designed by Gielow & Orr for Robert K. Cassatt, a wooden yacht 107 feet 3 inches over all, 101 feet 6 inches water-line, 20 feet 6 inches breadth and 3 feet 9 inches draught, of the deck-cabin type for Southern cruising. The twin screws are driven by two Winton engines, six-cylinder, 6½ by 9. Just ready for the water is a smaller wooden yacht of the popular patrol-boat type, by the same designers, for E. E. Dickinson, of Hartford, named Nautilus II. She is 66 feet over all, with plumb stem and stern, 11 feet 6 inches breadth and 3 feet 8 inches draught, with two six-cylinder 5½ by 6-inch Van Blerck engines.



A City Island-Built Yacht Reaching, With All Light Sails Drawing Well

Still another yacht by Gielow & Orr will be in frame shortly, Haida, building for Max Fleischmann, of Cincinnati. She will be of steel, a flush-decked boat, 144 feet 7 inches over all, 133 feet 7 inches water-line, 20 feet breadth and 7 feet 6 inches draught, with two Winton engines of the Diesel type six-cylinder, 11 by 14 inches. This yard has a contract for five of the 110-foot submarine chasers and work is progressing rapidly; the oak frames are bent on the bending bed of the steel shed instead of over the ordinary timber block of yacht-building.

The old Hawkins yard, now managed by Captain Lem Miller, is equipped for building but its work is mainly storing and hauling out through the season. City Island boasts of two yacht clubs, the Harlem, established on the East River in 1883 and now well located with a good anchorage facing Eastchester Bay, on the West side of the island, and a fine new clubhouse; the City Island, organized in 1906, facing the Sound from the East side.

Transit to City Island today is a very different matter from the old days when the new Burgess yachts building by Piepgras first tempted metropolitan yatchsmen to dare the dangers of exploration in the Bronx. The island is now a part of Greater New York, under the same municipal government as Manhattan itself; the L roads carry passengers through to the Harlem River Station, near old Port Morris, where electric trains continue the journey in short time to City Island Station, the old Bartow. That part of Rodmans Neck between the railway and the Sound is now a part of Pelham Bay Park, and good roads and inviting footpaths lead to the water. The sorry horse-car line which in turn replaced the early stages has finally given way to a modern electric railway that makes the trip but short from City Island Station to Beldens Point. The old wooden bridge disappeared some years ago, giving place to a fine steel structure on stone piers, and the main roadway, no longer partly under water in places, is a wide asphalted street. With good roads all the way, the ride by automobile from the city is a pleasant one, and by way of public routes a new one has recently opened, by subway to Westchester and automobile bus to the end of the island. With its natural advantages, its established yards and facilities for yacht-building and repairs, and its new accessibility from all parts of the city proper, City Island promises to be for many years to come the great center of yachting about New York and Long Island Sound.

The Power-Boat Game

By Charles A. Starr

EVER and anon there arises someone to deplore the decadence of the "power-boat game," as it is called, the "game" in this case being used to denote the racing. Why is it, is often asked, why is it that we no longer have the fine local races that brought zest to power-boating? Why is it that when fine prizes are offered for the Stratford Shoal, Albany, Cornfield Light or some other well-known race, the club members do not respond and there are scarce enough entries to go ahead with the race? Why is it that the "bugs" are hardly interested in the fact that there is a race, or as to which boat wins it?

These are not hypothetical questions, but those often asked on the club porch, and perhaps more often by the rocking-chair fleet than by the actual boat owners, the "bugs." Well, why is it?

Last year the Albany race of the New York M. B. C. was a flat failure as a racing event. True, two boats did go over the course and both of them received prizes, but no one pretends that it was a race, least of all the club members. And yet this has been for many years one of the classic events of local waters. There were a few more entries in the Cornfield Light race of the Colonial Y. C. and a little more interest, and the Columbia Y. C. race to Stratford Shoal had a still larger number of entries; but neither of them caused more than a slight flutter in racing circles. Why is it?

Well, it is something of a problem, but there are some former enthusiasts who believe they have an inkling as to why there is so little interest shown and so few care to enter their boats. Last year the price of gasolene was not enough higher to cut a large figure; this year it is a big factor, for with a high-powered engine licking up gas at the rate of from 50 cents to $5 per hour, a race 150 to 200 or 300 miles long means a large expenditure for the Rockefeller product. It is an item to give one pause if one's bank account be limited, and there are few boat owners who have figured in the racing game, outside of the speed-boat races of the American Power Boat Association, who could be considered wealthy.

Gasolene cost, however, is not the thing which stifled the racing spirit locally, for it began when gas cost but 12 to 15 cents per gallon—half the present price.

Last year, just before the Albany race, I asked the owner of a fine new boat why he had not entered. His boat had been entered in every race hereabouts previously and had been one of the frequent winners of the long-distance events. It was William E. Thomas, an old-time yachtsman, whose Fabius took almost everything in sight two seasons. His new boat, the Buto, is larger and even faster, but it did not make a single race last year and it is a question whether it will be entered this season. When I asked Mr. Thomas why he was not racing, he replied:

"Who, me? No, I'm not going to race. Why should I? My boat is fast enough, I guess, but it was not built just for racing. I cruise in it and sail about for pleasure. Why should I enter it against boats built expressly for racing by someone who has an axe to grind—something to exploit? Why should I spend my money for gasolene and oil and crew and other expenses to go up against some engine manufacturer or boatbuilder who wants advertising?



Beatrice, One of the Attractive Power Boats on the Great South Bay, Owned by Edwin C. Vom Hofe. Length 38 Ft. 6 In. Equipped With a 4-Cyl. 6-In. x 6-In. Van Blerck Engine; Speed 16 Miles

"These fellows put up an engine built especially for a race, put in a new engine every race, if they can find some improvement to make, and it doesn't interest me to enter against them. I cannot afford and have no desire to compete with such men. I guess I am through with racing until it ceases to be a manufacturer's game. I have not lost my interest in racing, but I have none in that kind of racing, and you can count me out until we get back to the days of pure amateurism. I am not advertising engines, except as might be incidental to my winning a race, nor am I going to act as a foil to the boosters of some make."

Mr. Thomas's statement of the case seems to reflect the opinion of others. It was plainly stated that every time there was a race of any standing someone would have a boat built whose chief aim was racing and not pleasure, powered with an engine put out by the manufacturer for the advertising to be had, manned by men from the factory, and the whole thing had such a flavor of professionalism that the event was robbed of its charm of amateur competition.

Back in the bicycle days racing meets were immensely popular until star racers were put out by the wheel and tire makers to boost their wares. Quickly the interest of riders waned and bike racing for years has been practically professional throughout. Automobile racing has been professional and its chief attraction has been the quantity and variety of thrills which the spectator might experience. Just as a bull fight or a prize fight, or some other blood-letting exhibition draws a throng, so the certainty of killing or maiming has its lure for many. To some extent this is true of the speed-boat races, though, of course, there are no fatalities and few accidents to craft, even. The thrill, otherwise, is there.

Now it is probable that most power-boat "bugs" find much pleasure at the speed-boat races; that is apparent from the number of boats which line the course every time. It shows that the racing spirit has not become decadent, and that some other cause must be sought for the lack of interest in the local events, so marked that many are cancelled.

The New York M. B. C. is making strenuous efforts to revive interest in its Albany race, which will be run before this appears in print. At this writing ten boats are entered from its own fleet and one or two outside boats have signified an intention to compete. There are once more signs of enthusiasm about the club and some boats which do not average better than 8½ or 9 miles are going to race. Where is the difference?

The chief reason seems to be that the club has returned to its first racing conditions. The race is open this year to "cruisers (except express cruisers) as defined by 1917 A. P. B. A. rules, under 50 feet over all in length." The second reason is the condition as to crew, which reads:

"Only amateurs will be allowed on boats during race. The committee will consider as ineligible those who derive their livelihood from sources directly connected with the operation, building or selling of boats or marine engines. Names and occupations of crews shall be handed to the committee in writing at least one hour before start."

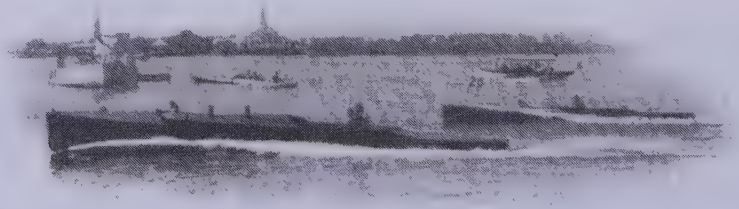
The race was inaugurated in 1909, when there were twelve cruisers as starters. In 1911 there were twenty-three entries—nineteen cruisers and four open boats. The past three years express cruisers were permitted to enter and the result was a fizzling out of interest.

I am betraying no confidence in stating that the regatta committee trusts that the change will keep out all of the objectionable entries; the conditions were designed for this purpose—to keep the race purely amateur. It may keep Mr. Thomas's Buto out; this is not decided at this writing, being based upon the interpretation of the term "express cruiser."

The call for speedy craft for the coast patrol and the utilization of a number of the boats which might make the Albany race, make it seem likely that for the first time in several years the race will be confined to Hudson cruisers, with perhaps one or two from the Sound. Whether this is true and whether the race ushers in a revival of racing interests on the river will be history before this appears.

Doubtless there always will be a clash between pure amateurism and the professional or semi-professional. The line of demarcation is difficult to draw, usually. For instance, it is impossible to debar men employed in automobile engine works—little different from marine gas engines—or experts in the trade, as crew members, under present rules. But may it not be time for the racing authorities to make such changes in rules and classification as will foster races between boats which shall be without taint or suspicion of professionalism or commercialism?

It may be that many will disagree with all this and claim that racing is profitless except it shall develop engines and craft and accessories. Very well; so be it. Have races for this purpose and they will be supported, if not participated in, by the common or garden variety of "bugs"; but do not inject it into the local events, say the Hudson River yachtsmen, else in a little while there will be no local events worth while.



The Wisdom of Solomon

By W. R. Gilbert

WITH a spanking breeze from the Westward, sweeping across the full expanse of the bay, the Mary Jane was at her best. Under the paternal eye of old Solomon, her owner, I had been learning the personal idiosyncrasies of the sloop and the ways of tricky currents for some weeks. My holiday had only another five or six days to run. I sighed as I looked aloft at the bellying sails and felt the exhilarating rush of water against the vessel's bows. We had spent a glorious morning with our fishing lines, and as I glanced at the old fisherman's weatherbeaten face, I envied him his life from the bottom of my soul.

"Just the teeniest touch of weather helm, sir," instructed Solomon. "Every boat, like a woman, runs the better for a little drag on her. Another inch of sheet! Keep her at that, sir."

"Hullo!" exclaimed I, pointing to the landing stage. "whose craft is that? She is a stranger surely."

Solomon, peering beneath the boom, screwed up his clean-shaven mouth sarcastically.

"Humph!" grunted he. "That's young Mr. Valentine's Frivolity. A centerboard concern. Goes well enough with a free sheet, but for beating to windward give me a good keel, sir."

"Who's Valentine?" asked I.

"The son of him who bought the big place beyond the hill there," replied the old man, irritably. "He's rich enough, but he ain't like him as sold it to him. And this young fellow is a bragging purseproud sprig, who thinks he has bought the world down this way." Suddenly glancing again to windward, he sprang to his feet. "Now then, sir, down with the helm, and bring her into the wind, while I run for'ard, and pick up the moorings."

Within a few seconds the sloop was at her buoy; Solomon let go the halyards. We quickly furled sails, made everything shipshape,, and then jumped into the dinghy.

On the landing stage as we stepped ashore, lolled a man of about thirty smoking a cigarette. He was attired in a yachting costume of most approved pattern, and he surveyed me with a stare of open patronage.

"Good evening," said he, coolly. "I see you've been taking a blow in the Mary Jane. A bit of a tub, eh?"

I shot a surreptitious glance at Solomon's face. The old man's gray eyes glittered ominously, but he said nothing.

"She suits me excellently," replied I, "and rather fast, I should say."

"Ha, ha! Fast, is she?" laughed he. "Why, my little boat over there could give her a quarter of a mile in a mile, and run away from her." A hoarse gurgle on my left was, after a moment's thought, translated by me to mean that Solomon was urging me to accept an offer to race.

"I am not so sure of that," I said, meditatively. "It would be rather fun to try over a triangular course. I am afraid, however, you would have to concede me some advantages, as I am perfectly ignorant of the rules of racing."

"Oh, rules be hanged!" cried Mr. Valentine boisterously. "You can break all the rules in the calendar for all I care. I assure you it would not affect the result in the least." He eyed me superciliously and jingled some loose change in his pocket. "I'll lay you three to one that I can give you ten minutes over a 15-mile course."

"Very well," I said quietly, "I'll take you in hundreds. Shall we say round Old Man Island, to the bell buoy, and home? That ought to be about the distance I imagine."

"It will be a walk-over, I assure you," drawled Mr. Valentine. "However, three hundred to a hundred it is." He chuckled loudly. "And if I don't reach home ten minutes before you, I'll—well, I'll eat my hat as well."

"And no rules whatever, remember!" added I, laughing. "As a lawyer I hate to mix up business with pleasure."

"Quite so! Come up and have a drink?"

"No, thanks, I must be off. Shall we say—"

"Thursday, sir," intervened Solomon.

"Yes, Thursday, or any other day," agreed Valentine, complacently. "It will give you time, my friend, to patch up your sails a bit, and scrape the barnacles off the bottom, eh?"

"There's many a good tune played on an old fiddle, sir," retorted Solomon, turning towards his cottage.

It was not long after sunrise next morning when seizing my towel, I started forth for my morning dip. Solomon was chopping wood in his yard, but with unusual alacrity he hurried after me.

"Good morning, sir," said he. "I've been doin' a bit o' thinkin' overnight—the Mary Jane is coming ashore tonight at full tide. That there Valentine has to be beat at any cost." Breaking into a series of chuckles, he slapped his thigh with delight. "By gum, sir, that was a great little condition you made about no rules."

"Well, Solomon, I don't see how it will help much," replied I; "but I am glad you are pleased, and if we can defeat the bumptious idiot, I'll give you a hundred for yourself."

"Thank you, sir. I'll begin to earn it this evening when the Mary Jane is beached. It will be best done after dark."

"What will?" inquired I.

Solomon laughed softly, looked about him like a guilty conspirator, and shuffled up close to me.

"Ever heard of black-lead on a vessel's bottom, sir—well polished?"

"No. I'm afraid not."

"Well, sir, that's what the Mary Jane is going to have done to her this very night—well scraped—well blacked—and well polished. It helps wonderful in slipping through the water, sir," whispered he, winking ponderously.

"Ah!"

"And mum's the word, sir," added the old man.

Solomon proved as good as his word. About sunset the sloop took the beach. At nine o'clock that night, the tide having fallen, Solomon began his labors. By that

time enthusiasm had seized me. Until midnight, with scarce a word between us, we worked like driven slaves. By the next high tide the bottom of the Mary Jane was as sleek as an iron stove.

There was still another day before the race. That morning I found Solomon studying the catspaws of wind upon the surface of the bay with deepest interest.

"In a couple of hours, sir, the wind will be blowing pretty fresh," declared he. "Before it rises I must sail the Mary Jane over to that neck of land across the bay where the stones grow."

"Stones grow?"

"Aye, sir. There's a good supply of comfortable ballast stones over there. I'm going to sail her over there without ballast and load up with stones. It's a dangerous game sailing the sloop without ballast, so I want to arrive before the wind gets too uppish. When we have loaded up it can blow how it likes."

"But what about your pig iron and lead ballast?" asked I, in wonderment.

"Dumped every ounce of it on the beach last night, sir," whispered he, winking. "You will admit, sir, before this race is finished that stone ballast is the best for Mary Jane."

Needless to say, I accompanied the old man on his sail in search of ballast. It proved to be a pretty tricky journey. The wind rising somewhat rapidly, the empty vessel skimmed across the water like a duck. With the main-sheet in one hand, and the tiller in the other, Solomon watched her like a cat watching a mouse. It was an exciting half-hour.

There was deep water beside the reef. We filled up the sloop below her bottom boards with stones as large as we could carry.

The great race was due to start at two o'clock. The triangular course was some six miles to the South, round the Island, four miles almost due West, round the bell buoy and home. There was a stiff breeze, threatening to increase from the Sou'west.

Young Valentine and his man comprised the crew of the Frivolity. And a trim little craft she looked as she swung at anchor with her mainsail set. I noticed her spinnaker-boom ready for action, and bemoaned its absence from the Mary Jane's equipment.

"Don't you worry, sir," grunted Solomon. "We won't have the wind sufficiently fair for a spinnaker at all, so we shan't miss it."

"Well," said Mr. Valentine, emerging from his motor car, "are you ready? I brought a shot gun, which my chauffeur can fire as a starting gun."

"Excellent," replied I. "We are quite ready."

Fifteen minutes later we were off.

The Mary Jane under two jibs, mainsail, and gaff-topsail, lay down to the breeze on our beam like a mad thing. The centerboard boat had got away first, but in a wind of that strength, she did not hold her lead long against the sail which the deep keeled sloop dared to carry. Inch by inch we edged nearer to the Frivolity's weather quarter. Then came Solomon's climax of delight, when, completely blanketing our opponent, we shot ahead.

"Hurrah!" gurgled I.

"'Taint nothin' to be specially proud of, sir. It is with the wind aft that the centerboard expects to run away from us. Up goes the centerboard, you see, sir, and she skids along like a duck, while we have a great keel dragging on us all the time. Still we're doing well, sir. If the Frivolity were to wind'ard and could see our blackened bottom now, Mr. Valentine would wish he hadn't talked so much of barnacles."

The Frivolity never caught us again. At the island we were still half a mile ahead. We had now to face the 4-mile beat to windward.

"We won't lose over this bit, anyway, sir," asserted Solomon. "The Mary Jane can hold her own against any centerboard ever built working to wind'ard."

It was very soon apparent the old man knew whereof he spoke. The wind strengthened, so we had to discard our second jib. Nevertheless, at the end of every tack we had gained still more. We both knew, however, that our real danger lay in the long stretch homewards on an even keel.

We turned the bell buoy beautifully.

"Now, then, sir," cried Solomon, diving into the for'ard hatch, "I'll show you something."

With the wind now on our port quarter we were surging along with every inch of canvas telling. I had no idea what the old man had in his mind. Presently, however, he emerged from the hatch bearing an ancient spinnaker. His stays and halyards were apparently already prepared, for in a moment he had made fast the halyards, and the great triangular sail was ready for hoisting.

"Luff, sir, for one second!" shouted he. The next moment I saw the great spinnaker—butt end upwards—bellying in the wind, and threatening to tear out our topmast from its stays. Solomon lost no valuable time. The next minute he had run aft a couple of topmast back stays, and had fastened them into ring bolts on the deck.

"There, sir, just look at that for a sail!" cried he jubilantly. "And there's the enemy just around the buoy now. You'll see, sir, as how she won't be able to rig her spinnaker boom." He laughed gleefully.

"Now, then, sir, I do hope your life is well insured, because over goes our ballast. I can't afford to throw away lead, but I don't mind stones."

For the next few minutes the old man worked at fever heat. And at every second we were gathering speed. It was a dangerous expedient, but, I thought well worth the risk. His task finished, Solomon sank down beside me and glanced astern.

"Look, sir," cried he presently. "Their spinnaker won't draw, and I'm d—d if they ain't following my tip in converting it into a balloon jib."

Despite their efforts, however, we held our own. And as each moment brought us nearer to our goal Solomon slapped his thigh again and again, and chortled with delight.

"It's the ballast that done it, sir," he muttered. Half an hour later Solomon and I rowed across to our opponent in our dinghy. Her owner greeted us with an angry shout.

"Look here," he yelled, shaking his fist at Solomon, "you old scoundrel, you know perfectly well that you may not shift or throw ballast over, in a race. It's against all rules."

"Ah! I shouldn't be surprised if black-leading a yacht's bottom wasn't customary either," intervened I, with a smile.

"What!" ejaculated Valentine, his face purple.

"I am afraid, Mr. Valentine, that the most infallible of us have to pay sometimes for our experience," answered I. "Your lesson, though seemingly expensive, is after all fairly cheap."

Solomon's grin, as he again bent to his oars, was the broadest I have ever seen.

Seagoing Power Boats

By R. M. Haddock

THE seagoing qualities of the present fleet of power boats and gasolene-driven yachts, although much vaunted by their designers, builders and owners, seem for the most part to be decided negative quantities.

From the viewpoint of the majority of the power-boating fraternity, a good sea-boat is one that can worry along for three or four hours on Long Island Sound through a mild "Easter" or summer thunder squall, making a sheltered harbor with a more or less exhausted crew, and with things below decks rather moist and in much the general condition of the celebrated hurrah's nest.

The exigency of the time has brought out the almost entire lack of sturdy weatherly qualities which are so desirable in cruising craft, and which have been sacrificed for many causes, among which are the craze for extreme speed, an unnecessary amount of luxurious accommodations, and the installation of a great variety of auxiliary equipment, which at best are mere toys, occupying much space and requiring constant attention to keep in working order, serving in the main only as playthings to the owner, and usually failing under stress of weather.

All equipment for sea service should be compact and rugged as possible, installed in accessible places and of the greatest simplicity of design and construction.

The definition of a seagoing boat as pertaining to this article is one that can go out in the open ocean and stay there from five days to two weeks, be self-sustaining as to fuel and stores for these periods, and able to remain away from harbors for the total run.

In the boats as at present designed, this would eliminate the high-speed engine, as their fuel consumption is so great as to make the placing of tanks of sufficient size an impossibility.

In converting the power boats taken over by the U. S. Government it is desired to give all boats a radius of 1,200 miles with one filling of the tanks, and as a matter of fact about 450 miles is about the average of the larger boats, few being over and many falling below this figure. This means about trebling the present supply, which in these modern hulls with no depth under the flooring means that the tanks must be placed under transoms, in the middle of cabin floors or on decks and roofs, which latter places the weights dangerously high and is not to be resorted to except in extreme cases.

Water tankage also must be increased to take care of the augmented number of the crew, and it is surprising to find boats intended to accommodate six or eight persons in normal times with a tank of 35 or 40 gallons.

The placing of engines under low cockpit or bridge floors, access being through flush hatches or trap-doors, is bad practice and would condemn an otherwise good craft for use at sea; for if trouble develops the engine is inaccessible inasmuch as a man cannot work to advantage when jammed into close quarters in rough waters, and a small boat is always rolling to some extent when at sea.

Lack of headroom in an engine room is another faulty not to say dangerous feature, serious injury being liable to result to the engine-room force when tossed about. The hatches over the engine invariably leak and when water comes aboard it soon finds it way to the ignition wires, putting the engine out of commission where the jump-spark system is in use. This scores one point in favor of the make-and-break system, which continues to run even though the wiring is dripping with water for long periods, and which often happens at sea.

Placing the engine too close to the skin of the boat is also bad as any water at all in the bilge will be thrown by clutch and flywheel, and in the case of the latter a pan to keep the water from it should be included in all installations. The matter of protection to clutch is more difficult in practice, and it is better to raise the whole engine a few inches and to provide ample limbers under the beds with a copper chain rove through them that they may be kept clear so that water may reach the pumps.

Another very prevalent position chosen for the engines is well up in the bow. This gives the widest part of the hull for cabin accommodation, and is a very good arrangement for boats intended for use in sheltered waters, but it is altogether bad where seagoing boats are concerned. The weight when so placed causes the boat to dive deeply in a head sea and recover slowly and at the same time steer badly. In cases where the engines must be so placed the hull should be fine aft with little buoyancy above the water-line so as to have slight lifting power, which tends to hold the bow down and keep it buried.

This condemns the present popular type of wide sterns of the "V" rounded or square transoms with their full and flat floor sections, which have been developed from the inverted wedge form for high-speed boats, for use in seagoing cruisers. The shallowness of draught prevailing in this type is opposed to a good seagoing form as is their great flatness of floor throughout. This flatness is of course found in all large ocean steamers and is here permissible, as their draught is great in proportion to their length, and the flatness does not extend into the ends, which are fined away at bow and stern.

In a modern power boat of 100 feet, the draught is seldom over 4½ feet at the wheels or after end of the deadwood, the body of the boat being nearer to 3 feet in depth below the water-line. Such a boat if flat sectioned at the ends pounds heavily in a head sea and makes generally bad weather of it; also making much leeway with winds and sea on the side or quarters. There is no lateral plane in such a type to resist the forces of the wind and scend of the seas. The above is also true of the smaller sizes, though they are somewhat deeper in proportion.

Too much drag or depth aft to the keel makes a boat that turns quickly and is uneasy on the helm and difficult to make good a compass course at sea, as also is a keel with much rocker, as it is termed. These boats are very wearing on the helmsman, as he must be con-

stantly spinning the wheel in an effort to keep the ship on her course, the best that can be done being to catch her at from one-half to one point off her course on either side covering additional distance, retarding the speed by having the rudder continuously across her stern and putting extra strain, wear and tear on the whole steering gear. A keel that is straight with slight drag, while it will take most of the proverbial ten-acre lot to turn in, goes beautifully straight on its course, and we mostly have something over eleven acres at any sea. Considerable drag in a sailing craft is necessary in order that she may be quick in stays and not get in irons, which is to lose headway while in the wind when tacking and drifting sternward be unable to fall off on either tack, a condition that does not obtain in a power-driven vessel. Too much balance to the rudder also makes a quick uneasy boat on the helm and one difficult to keep on her course.

The above attributes, while essential for a high-speed boat for use in sheltered and congested waters, are very undesirable in her seagoing sister. The matter of not rounding up so quickly to meet seas in the case of the slow-turning boat is offset by the fact that she does not yaw so widely and needs less time for the maneuver, and on all other points of sailing the slow-turning craft will be found superior for open water work.

The position of the engines should not be further forward of amidships than their own length, and are better when aft of that point, and as a boat hinges as it were at about one-third of her water-line length from the stern, there is less motion in this portion of the hull and the engineer has better conditions to work at, and to care for the engines here than at any other part of the vessel.

Another feature of shoal-bodied, flat-floored boats is, that they have too much natural stability, due to too great metacentric height, and when heeled by the action of the waves tend to regain uprightness too suddenly, resulting in a sharp jerky roll very wearing to those on board and hard on the boat's structure generally. It is much better to have a wider angle of roll with a slow easy recovery. The form of the midship section should be deep with sharp dead-rise, with frames having a reverse curve, or "S" frames as they are commonly called, to keep down an excessive volume of displacement and avoid the necessity for a large amount of ballast to bring the boat down to her lines. An opportunity is here given to install fuel and water tanks of large capacity, acting as ballast when full and so arranged that sea water can be admitted when empty to maintain the trim and stability.

The sections at the bow should be sharp at the keel having a good flare evenly distributed from keel to deck, and not of the popular "U" form with sides perpendicular and a sudden flaring out at the deck-line. In the former case the displacement is so disposed that the bow strikes the water lightly when pitching, and the easy gain in buoyancy checks the boat gently and prevents deep diving, whereas with the "U" form as mentioned above the bow hits the water with a sharp blow and diving deeply lands heavily on the excessive flam, as it is called, which drives the water up into the air to be blown back over the boat, making her both wet and uncomfortable. The only place where this form of bow is of use is in a high-speed boat of low freeboard when driven through a chop of broken water, where the boat does not pitch but runs evenly, in which case it serves to keep down the spray and give good deck roo over a fine water-line forward. Beyond this point, i usefulness does not extend.

The water-lines at the stern should also be fair sharp though rounded out. The compromise, or cano stern as it is called, is a very desirable form. Where wide transom stern is desired to secure deck room th sections should rise sharply from the water-line, and n lie flat and close to the water as in the high-speed form stern. The former type has sufficient buoyancy to li with a following sea, but not so much as to prevent th bow from rising quickly or to heave the stern off to le ward when running, giving the boat a tendency to broac to.

A good crown to the foredeck, or a turtleback, tend to free the deck quickly of any water which may com aboard. This turtleback should have a moderate crow to the top surface to give secure footing and turn dow quickly at the sides.

In the choosing of windows and openings for ligh and ventilation portlights are the only satisfactory on for outside work, as they can be made watertight rubber gaskets and are not liable to be broken in by t seas, and are not subject to the many leaks that are co stantly developing in the square wooden sash type windows.

Coamings and hatches 2 to 3 inches in heig commonly prevailing are mere jokes when it comes keeping out the sea and must be kept closed except the finest weather; whereas a height of from 10 18 inches, or more, could be left open most of t time giving good ventilation below in warm weathe Door sills also come under the same general consider tions and should be from 8 to 12 inches in height.

Companionways leading down from the after end a bridge-deck as so often met with, while serving ventilators in fair weather, are a dangerous contraptic and should be eschewed. In the event of a sea carryin away the doors and slide, a not impossible contingenc by any means, much difficulty would ensue in an attem to stop up such an opening. Where it is essential to ha a hatch from the bridge leading to fore end of house, box hatch with good coaming height with a cover closi on a rubber gasket, with means to adjust the height cover, will take care of the ventilation and furnish safe access to quarters below decks.

Ventilation should be secured to all compartments well-placed cowl ventilators of ample size and streng well secured in place, and provided with deck plates be used in case they should be carried away. Some these cowls should lead clear down to the bilge belo the flooring before discharging the air, as gases from t engines usually lie low down in the hull and gradual vitiate the air.

At sea, top weights should be kept at a minimum, why the dummy stack on so many boats? The on excuse is for the engine mufflers and exhaust pip another additional top weight when so placed, and mu better disposed of when carried out of the stern, whi by the way is the correct principle, for if taken out the side of the hull below the water-line, or at or abo it for that matter, vibrates the boat badly when rolli and the fumes come aboard either forward or aft as t wind may be, thus making it unpleasant for someo aboard at all times; whereas if led out of the stern is only when the wind is dead aft and of a greater spe than the boat that any inconvenience from this cau

ensues. If it is desired to take exhaust out of side, close to the engine, the main pipe should lead right across the boat so that one end may always be free to exhaust in the air as the boat rolls, eliminating jar and vibration.

In looking over the present-day fleet one would be led to conclude that more attention had been given to verandas, loggias, pergolas, inglenooks, fireplaces, cozy-corners and Italian garden effects, rather than to good habitable seaworthy craft, suitable for use in all weather conditions, fair or rainy. For the most part ventilation has been badly looked after and with the slightest summer shower one must shut up everything and be all but hermetically sealed, almost to the point of suffocation, in order to keep things below decks dry. Also in considering the lines of the hulls it would seem that the designers were more of the glorified house architect than of the naval variety.

A course in naval architecture and some years in drafting room do not make a designer by a thousand miles and then some. He should have actual experience at sea in boats of the class that he is attempting to design, not only in fair-weather runs from Nortons Point to Fire Island Inlet or Barnegat, or from Watch Hill to Point Judith, but should go offshore with fishermen in the every-day pursuit of their calling, make a trip to Bermuda, Havana, or a few runs with some of the small craft in the Pacific coastwise trade. One such trip will furnish more experience in twenty-four hours than twenty-four years at the drafting board, and even more than long gazing at the sea pictures of that real sailorman and artist, Warren Sheppard, when hung on the drafting room wall.

The designers for the most part have a perfectly good alibi, in the statement that the owners wanted the type and arrangement in question, and this, sad to relate, is in many cases the truth, and only goes to show that it is high time that some missionary work should be put forward to educate these newcomers who are in no sense sailors brought up on the water from childhood, as were those who manned the old fleets of windjammers a few years since, but are recruited from the ranks of the devotees of the gas engine.

If your boat does not have a speed of, say, 14 miles an hour she will certainly not set the speed bugs afire with admiration, and while you may be able to pass some number of boats, someone will surely come along that will make you look like a crab and take all the joy out of life for the time being; so why not better to have a real ship of good weatherly qualities, a fair turn of speed and sweet lines and good livable accommodations that any sailor passing will turn and look at with the comment, if only to himself, that there goes a trim little ship that looks, and is, fit to take whatever old Neptune may have in store for her.

Many good people purchase their boats much as they would their automobiles, mainly through advertisement or a glib salesman with a one-hundred horsepower de luxe line of talk and a pinhead conception of the conditions that the boat has to contend with in actual use.

In boats for the rough open waters the position of the galley is of much importance and should be located in the after end of the cabinhouse, as here there is less motion to upset cooking utensils and it is handy to receive ice and stores from the after deck, most of the cooking odors blowing aft clear of the cabin instead of all through, as when galley is forward.

In selecting an engine equipment for these types of boats the slow-speed, heavy-duty machines are preeminently the ones to be chosen. Revolutions higher than five hundred per minute are to be looked at askance for this service. Ask the paid hands in the engine rooms, the fishermen, and others who have to earn their daily bread in the small coastwise commercial craft, and you will soon get at the truth, for these men, in the majority of cases, know whereof they speak, having the practical first-hand knowledge at their command.

High-speed machines have their field in the light runabouts, express cruisers, and such boats as will be used on sheltered waters, and here they give most satisfactory results.

In this field also there is room for the high-speed, light-constructed craft with large window openings, broken up superstructure, shoal body, sharp bows and wide sterns, with engine locations and living quarters disposed as best suits the uses and whims of the owners, and giving perfect satisfaction; all these being a class which, while most overwhelmingly preponderant, are not within the province of this article.

In closing, will remark that in the installation of the engine and fuel system no expense should be spared to secure the very best installation possible, as herein lies the safety of the boat and all on board when at sea. Fuel should be fed from an auxiliary tank above the engine, which in turn was supplied from the tanks in the bilge either under air pressure or by a pump. Feed pipes should be of copper or brass of generous size, say not less than one-half inch, and to have a good strainer placed close up to the carbureter.

Good and efficient bilge pumps should be installed of two or three times the capacity of the little brass barrel and rubber hose contraptions that are usually found on board. A good spare pump being of the spiral tube type of galvanized iron with a good long detachable spout, pump to be three and a half or four inches in diameter, with cross handle and a leather cup lift valve; the variety, in fact, that is used to pump out cellars and ditches. This may be placed where needed and moved about as necessary, and should it clog can be quickly emptied out and cleaned. Above all, it will really pump half a bucketful at a stroke.

The lighting of the sailing lights and binnacle should be by electricity, as they are not affected by winds, as are the oil-burning lamps. Nevertheless, these latter attachments should be on board for use in the event of failure of the electric source.

In the matter of lighting, electricity is the safest, most convenient and best. Where it is possible it should be generated by a separate generator independent of the main engines, and a system of storage batteries installed.

Good kedge anchors should be provided, with plenty of length to the rodes, and where boats are to be used around the Bahamas or any coral formation locality, chain cable should also be at hand. A good folding sea-anchor is also necessary and oil bags stuffed with oakum should be included in the equipment.

Not only is the type of boat described herein a better one for sea service but faster at sea than the shoaler boat, which pounds and thrashes, while the deeper and sharper hull, with its additional weight of ballast, cuts its way easily through the seas, maintaining an even rate of speed at all times.

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART VII

IF it is desired to use the best kinds of materials for construction the selection must be as follows:

For keel, stem, floor timbers, ribs, deck beams. White Oak
For deadwood and clamps ..... Yellow pine
For engine foundation ..... Oak
For knees ..... Hackmatack
For planking ..... White cedar
For decking ..... Mahogany
For covering boards ..... Mahogany
For joinerwork and coaming ..... Mahogany
Fastenings, copper riveted and brass screws.

All the above are 1 class materials.

When two or more different kinds of wood have the same value for a part, the selection is usually governed by the commercial value, or cost of woods named. It is usual to select the least expensive, providing other things are equal.

Study the table and use it to help you select kinds of material to use for construction of boats you design.

Displacement Necessary.—Select dimensions of materials and kinds to use, then calculate the displacement necessary by making short calculations in the manner explained in December, 1916, issue of THE RUDDER, on pages 12-14.

The Table of Weights of Materials is given in December, 1916, issue of THE RUDDER, on page 12.

The explanation referred to says: "Divide the construction, etc., into a few principal parts, calculate the weights of each and add totals. For a small cabin cruiser of type I will design the following is a convenient division:

Part No. 1.—Materials in keel, stem, deadwood, engine foundation, etc.

Part No. 2.—Materials in frame, planking, decking, flooring, roofing.

Part No. 3.—Joinerwork materials.

Part No. 4.—Engine and its equipment.

Part No. 5.—Fuel and tanks. Also water and tanks.

Part No. 6.—Fittings and furnishings.

Part No. 7.—Passengers and crew.

Part No. 8.—Stores.

If the weight of each part is calculated and figures are totaled the total will be the approximate weight of boat and all on board when in sailing trim. This weight can be considered to be the *displacement* necessary.

2d Preliminary Calculation. Area, etc., of Midship Section.—Midship section is the name given to largest underwater cross-section of boat It is not necessary that this section be located midway between bow and stern, and as a matter of fact it is usually located some distance aft of the middle point. The location of midship section determines the relative lengths of fore-and-after body because portion of boat ahead of it is the fore body and portion aft the after body.

The area of midship section also furnishes one measure for determining resistance of a boat to passageway through water.

Before area of midship section can be selected it is necessary to decide the following:

The length of boat on L.W.L.

The breadth on L.W.L.

The draught of water from L.W.L. to rabbet at midship section.

Length on L.W.L. can generally be determined without making any calculation. The shape of ends of boat usually determines how much shorter the boat will be on L.W.L. than over all.

The *breadth* on L.W.L.—The extreme width of boat is usually on deck, or near to it, therefore, unless boat is one of abnormal shape, the width on L.W.L. is usually less than the deck width. It is important to keep in mind the fact that breadth has an important bearing on stability and any increase in breadth at, or near to, L.W.L. increases a boat's transverse stability.

Draught of water to rabbet at midship section. The draught of water to rabbet at midship section of boats having outside keel and deadwood that is carried aft to stern post is nearly always less than the extreme draught, the proportion being between .7 and .8 of extreme draught. The designer must select the most suitable draught for the displacement necessary and the shape of midship section he intends to use.

The Area of Midship Section Necessary.—Having selected width on L.W.L. and depth to rabbet at midship section you can determine area necessary by using the selected figures and a suitable coefficient multiplier because

> Breadth at midship section × Depth of section to rabbet × Coefficient will equal required area of midship section.

The coefficient used when making this calculation is termed the *midship* section coefficient of fineness.

The midship section coefficient of fineness expresses the ratio that underwater portion of midship section bears to a *rectangle* having a width equal to the width of midship section at L.W.L. and a depth equal to depth of midship section measured from L.W.L. to rabbet of keel.

For instance, the first boat on Table No. 5 has a midship section breadth on L.W.L. of 6.13 feet, and a depth at midship, to rabbet from L.W.L., of 1.25 foot; therefore the midship rectangle is 7.66 square feet, and as the midship section area is 4.7 square feet the midship section coefficient of fineness must be 0.613.

$$\frac{4.7}{7.66} = 0.613 \text{ Midship coefficient.}$$

Below I give table of midship section coefficient of fineness compiled from data of designs prepared in our office.

TABLE No. 5

MIDSHIP SECTION COEFFICIENT OF FINENESS

Type of Boat	** Dimensions over all	Displacement in Lbs.	*** L.W.L. Breadth	* Midship Depth	Midship Area	Midship Coeff.
Open.....	25 x 7	4540	6.13	1.25	4.7	0.61
Open.....	25 x 7	4660	6.50	1.00	4.8	0.75
Cabin.....	30 x 7	6300	6.25	1.40	5.4	0.82
Cabin.....	30 x 8	7600	7.00	1.33	5.8	0.64
Crusier.....	32 x 8.5	9100	8.00	1.75	8.4	0.60
Cruiser.....	36 x 9	12526	8.25	1.83	9.4	0.62
Cruiser.....	42 x 9.3	18700	8.56	2.30	13.0	0.65
Cruiser.....	50 x 11	27560	10.40	2.10	14.42	0.66
Cruiser.....	52 x 12	30464	.....	.....	14.83	0.66

* Midship depth is measured from L.W.L. to Rabbet. Therefore area of midship section must also be measured from L.W.L. to Rabbet only.

** The dimensions are over all length and breadth.

*** The L.W.L. breadth is given in feet and decimal parts of a foot. In fact, all measures are expressed in this manner.

Fig. 30 illustrates the way midship section coefficient is calculated.

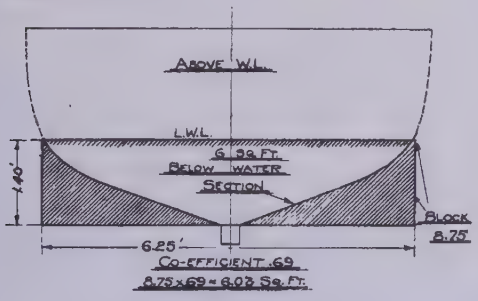


Fig. 30

Shape of Midship Section.—The midship section must not only be correct in area but its shape must be such that boat will prove stable, that displacement will be properly distributed, and resistance to propulsion at a minimum.

The shape of midship section has an important influence upon the things mentioned. On stability because of the influence shape has in the vertical position of C.B. point when boat is upright and when inclined transversely. On resistance, because of the influence that immersed surface and distribution of displacement has on resistance to propulsion, and on proper distribution, because of the influence that midship section shape and area has on all longitudinal and vertical lines of a boat.

The most desirable shape for midship section of cabin cruisers is one having a maximum width and area at or near to the L.W.L., and having a well-rounded bilge connected to keel by straight lines. Rounding connecting lines from bilge to rabbet tend to increase rolling. And as area of immersed surface should be kept low straight lines keep area as low as possible without any offsetting detriment.

When selecting the form of midship section to use keep in mind these important points:

1st.—That the *bottom* (that portion of the section below the wedges of immersion and emersion) tends to overset, and the shoulders (the portion that is in and out of the water as the boat heels transversely) tends to overcome the upsetting force of the bottom.

2d.—That midship section shape largely influences the shapes of all cross-sections ahead and aft because it being the section of greatest area all smaller sections must conform to its shape and merge into it.

3d.—That the abovewater portion must be proportioned to underwater portion in both shape and area.

The abovewater portion of a boat must have sufficient buoyancy to make a boat safe in a seaway, and in addition to this it must be shaped in such a manner that this surplus buoyancy is properly distributed fore-and-aft and also vertically.

The influence of midship section shape on shape of fore-and-aft sections extends from keel to sheer of boat.

4th.—It is always a good plan, especially in boats depending on *shape* for stability, to give the midship section ample breadth of shoulder and to make *bottom* area as small as consistent with getting the area and depth of section needed.

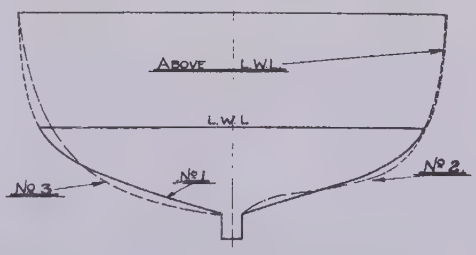


Fig. 31

Fig. 31 illustration shows three different shapes of midship section suitable for a small power cruiser. The solid lined section indicated by No. 1 shows shape selected for the one I will design, the underwater portion of section being marked by full lines and abovewater portion by broken ones.*

The dot-and-dash-lined section marked No. 2 shows shape having connecting line from bilge to rabbet slightly reversed. This section has same underwater area, breadth at L.W.L. and depth to rabbet as the No. 1, but a portion of area is transferred from near keel to bilge, thus increasing stability transversely, because the nearer the bulk of the area is to L.W.L. the greater will be the resistance to inclination.

The dash-lined section marked No. 3 shows a shape having rounded lines. The area is the same as that of No. 1, 2 sections but as the bulk of displacement is moved towards keel and the lines bounding section are rounded ones from keel to bilge the section shape is a most un-

*The abovewater portion of sections is shown for the purpose of illustrating how the shape of underwater body affects abovewater shape. The lines bounding cross-sections of a boat must be fair ones from keel to deck, therefore any change in underwater shape will also affect the abovewater shape. Then you must always bear in mind that the wedges of immersion and emersion form portions of both the under and abovewater body.

desirable one. A boat having a section shaped like No. 3 will roll very easily and be exceedingly uncomfortable when there is the least motion transversely.

Avoid rounding lines without any pronounced bilge if you want to have a boat that is steady and comfortable.

Location of Midship Section.—It is usual to locate the greatest cross-section some distance *aft* of center of fore-and-aft length of water-line because by doing this the length of lines that open water is increased and thus resistance to propulsion is decreased. In addition to this in the majority of boats a proper balance of fore-and-aft bodies, which is of the utmost importance, can best be obtained when fore body is longer than after. The proportion of length of fore body to that of after body most desirable for power cruisers is about 55 and 45. Or in other words the length of fore body should be about 55% of L.W.L. length and after body length about 45%.

3d Preliminary Calculation. Area and Shape of L.W.L.—The L.W.L. (load water-line) is the principal water-line of a boat and is the line to which the boat floats when she is in sailing trim. This line has the greatest area of all longitudinal water-lines and its shape influences the shape of all below and above water longitudinal lines in exactly the same manner that midship section shape influences the shape of all sections ahead and aft of it. The designer, when he prepares the preliminary drawing, selects a desirable draught of water and marks the L.W.L. at that point. He now *assumes* that the marked L.W.L. is correctly placed and proceeds to select the most suitable shape and area. The designer who has data to help him can quickly select the required area by using a suitable coefficient and making a short calculation.

Length L.W.L. × Breadth L.W.L. × Coefficient = Required area.

The length and breadth measures being the measures determined upon as being most suitable and the coefficient multiplier being the figures which will express the ratio that the area of the L.W.L. plane bears to the area of a rectangular plane having a length equal to the length of the L.W.L. and a width equal to the greatest breadth of L.W.L.

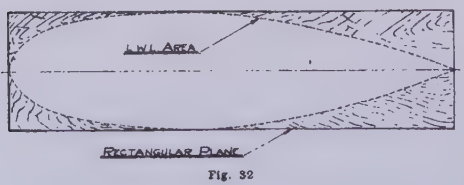


Fig. 32

Fig. 32 illustrates the meaning of coefficient of fineness of L.W.L. plane. On that illustration the shaded portion of rectangle shows portion of plane that is cut away in shaping L.W.L., and blank portion the area of L.W.L. plane.

Coefficients of L.W.L. planes of power cruisers vary from .6 for boats having fine ends up to .8 for those having full ends.

In selecting a coefficient the designer usually relies upon data obtained from boats he has designed.

Remember one thing: the area of L.W.L. plane should be proportioned to area of midship section, and to displacement.

The successful boat is always one in which proportions *balance* and the centers are properly located.

If one detail is out of proportion, or if one center is improperly located, a correct balance cannot be obtained and the strains and stresses that result from the effort made to overcome the defects of this improper balance will be plainly apparent and result in an increase of resistance, a decrease of stability, or unseaworthiness.

Every detail of both under and above water portions of a boat must be correctly proportioned to each other.

For instance, to give a boat a moderate displacement and a full midship section and then finding that displacement is too large to try to correct the mistake by making fore-and-aft lines extremely fine at ends will not prove successful and may result in making the boat a failure. The proper thing to do in such a case is to reduce area of midship section in proportion to reduction in fullness of the fore-and-aft lines.

Bear in mind that while a boat is designed on lines that are taken at right angles to each other the water does not follow along these lines but along paths of *least* resistance, and these paths are nearly always along lines that are located at varying angles with the vertical and horizontal.

TABLE No. 6

TABLE OF COEFFICIENTS OF FINENESS OF L.W.L. PLANES

Type of Boat	Dimensions over all	Displacement in Lbs.	Length L.W.L.	Breadth L.W.L.	Coeff. of Fineness
Open... ..	25 x 7	4540	22 .5	6 15	0.68
Open.. .	25 x 7	4660	24 0	6.50	0 70
*Cabin T..	30 x 7	6177	27.75	6.25	0.67
Cabin T. ..	30 x 7	6300	26 50	6.25	0.64
Cabin T..	30 x 8	6700	28.00	7.00	0.68
Cabin T.	32 x 8 .5	9100	30.00	8.00	0 64
**Cabin R..	36 x 9	12526	34 00	8 25	0.74
Cabin R. .	40 x 9	17662	36.30	8.12	0.71
Cabin R. .	42 x 9 .3	18700	38.00	8.56	0.68
Cabin R..	50 x 11	27560	48 00	9.75	0.67
Cabin R....	50 x 11	28050	46.80	9.50	0.66
Cabin R...	50 x 11	28464	47 00	9.60	0 71

*T Indicates Trunk cabin.
**R Indicates Raised cabin.

The Value of Coefficients.—Coefficients place at the disposal of an architect a valuable means for comparing the elements of one design with that of another, and in addition to this the architect who has tables of coefficients can with great accuracy and without the necessity of making preliminary calculations, determine the required area of midship section, area of L.W.L. plane, and displacement, by simply selecting the proper coefficients and using them to make the short calculations explained.

As an illustration of value in shortening the work we will suppose a design has to be prepared.

The displacement found necessary, by making the preliminary calculations, is 4,200 lb, and the dimensions of boat are to be 24 by 5 feet 10 inches, but we do not know what area of L.W.L. plane and midship section is necessary. By turning to the coefficient tables and selecting from them what seems to be the most suitable coefficients the necessary areas can be ascertained with reasonable certainty.

Block Coefficient of Fineness.—The *block coefficient* of fineness expresses the ratio that a boat's displacement

bears to that of a rectangular block having a length equal to L.W.L. length of boat, a breadth equal to L.W.L. breadth of boat at widest part, and a depth equal to *mean* draught of water without outside keel.

The mean draught of a boat is the *average* draught taken from bow to stern. If the boat draws the same amount of water forward and aft (as in the case of No. 14 boat) the mean draught and extreme draught are the same.

If it is desired to find out, before designing a boat, what the displacement is likely to be to the draught of water selected, by using the selected length, breadth and draught of water dimensions and a suitable coefficient multiplier in the manner explained below, the displacement can be ascertained very accurately.

The length measure used is length boat will be on L.W.L.

The breadth measure used is extreme breadth on L.W.L.

The depth measure used is *mean* draught of water without outside keel.

The coefficient multiplier used must accurately represent the ratio that displacement of boat bears to displacement of a rectangular block of same length, breadth, and depth as the selected dimensions of boat.

The bulk and displacement of a rectangular shaped boat can be accurately found in the following manner:

Length × Breadth × Depth = Volume in cubic feet.

If the corners, or any part of the rectangular boat be cut away the bulk and displacement can still be accurately ascertained by adding to the above formula a multiplier to accurately express the ratio that the new shape bears to that of the original rectangular block.

The calculation becomes:

Length × Breadth × Depth × Coefficient = Volume in cubic feet.

The coefficient multiplier varies with each change in shape of boat. This method of calculating displacement is called finding the probable displacement by using a block coefficient of fineness multiplier. In order to make use of this rule the designer must *know* through experience the correct coefficient to select.

To ascertain the *block* coefficient of fineness of any boat divide volume of displacement in cubic feet by volume of the rectangular block in cubic feet.

Or if the block coefficient is known and it is desired to ascertain what the displacement will be when selected coefficient is used, the calculation is made by multiplying the volume of block in cubic feet by the selected coefficient.

Prismatic Coefficient of Fineness.—The prismatic coefficient of fineness expresses the ratio that volume of displacement bears to volume of a prismatic solid having a constant cross-section area equal to the midship-section area of boat, and having a length equal to length of boat on L.W.L.

In other words, if the length of boat on L.W.L. is multiplied by the area of immersed cross-section the volume of the *prismatic solid will be ascertained*. Then if this volume is multiplied by the proper coefficient the volume of displacement of boat can be ascertained.

To ascertain the prismatic coefficient of any boat the volume of displacement is divided by the volume of prism.

For a certain boat the prismatic coefficient calculation figures are as follows:

22.5* × 4.7† = 105.75 Volume of Prism.

If the volume of displacement is 69.9 cubic feet, the prismatic coefficient is

$$\frac{69.9}{105.75} = .66$$

Or, if the prismatic coefficient has been selected and volume of prism is known the desired displacement can be ascertained by making this calculation:
105.75 × .66 = 69.79 cubic feet displacement required.

To explain the meaning of prismatic solid and this coefficient calculation I have made Fig. 33. The heavy lines show a solid having a constant cross-section of the area of midship section immersed portion. The lines therefore show a square-fronted and ended boat having the same cross-section from end to end. The broken lines indicate shape of boat after ends have been cut away, therefore the portion of ends between the broken and full lines is the portion cut away from prism when shaping the fore-and-aft lines.

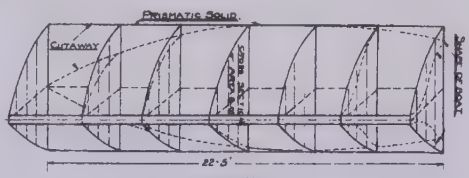


Fig. 33

Do not confuse this calculation with the one explained under the heading *block coefficient of fineness.*

Shape of L.W.L. for Power Boats.—In selecting a shape for the L.W.L. the designer has great freedom of choice. It is, however, necessary to keep these things in mind:

1st.—The shape of the L.W.L. plane really determines the shape of all the water planes below it, and greatly influences the shape of the fore-and-aft lines above it.

2d.—All water planes must be fair curves from end to end, any abrupt alteration in shape of curved outline is detrimental to speed because it will increase resistance.

3d.—The area enclosed by L.W.L. must be sufficient to insure stability.

4th.—The C.G. of the L.W.L. plane will, in a great measure, determine the location, in a fore-and-aft direction, of the C.B.

If midship section is located correctly the logical and best position for the C.G. of L.W.L. plane is at, or near, the midship section, and then if the underwater bulk of boat is shaped so that its center point (the C.B.) will come near the midship section and the C.G. of L.W.L. plane, an ideal condition of balance is obtained.

In other words the center point (C.G.) of the L.W.L. plane should be located near to midship section.

From these remarks you will understand the importance attached to shaping the L.W.L. correctly and in such a manner that the displacement can be properly distributed in a fore-and-aft direction, and in addition to

*Length of prism.
†Cross-section area of prism.

TABLE No. 7

TABLE OF PRISMATIC COEFFICIENT AND TRANSVERSE M.C. HEIGHTS

Type of Boat	Dimensions over all	Displacement in C. Ft.	Area of L.W.L.	M. I. of L.W.L.*	M. C.** Height	Prismatic Coeff.
Open.....	25 x 7	71****	94	215	1.85	0.68***
Open.....	25 x 7	73	109	270	1.90	0.64
Cabin T.....	30 x 7	96	116	269	1.90	0.59
Cabin T.....	30 x 7	98	105	265	1.75	0.69
Cabin T.....	30 x 8	106	133	300	1.55	0.65
Cabin T.....	32 x 8.5	142	154	450	1.65	0.57
Cabin R.....	36 x 9	195	195	816	2.55	0.61
Cabin R.....	40 x 9	278	211	832	1.33	0.61
Cabin R.....	42 x 9.3	292	220	870	1.50	0.59
Cabin R.....	50 x 11	430	313	1750	2.20	0.63
Cabin R.....	50 x 11	439	295	1519	1.67	0.61
Cabin R.....	50 x 11	444	320	1700	2.00	0.63

*M.I. of L.W.L. around a longitudinal axis through C.G. of plane.
**The height that the *Transverse M.C.* point is above the C.G.
***The nearest two places of decimals.
****Decimals omitted.

this the L.W.L. plane area must be sufficient to insure ample stability.

At this point it will be especially appropriate for me to digress and explain the *wave* line theory of shaping water-lines, and the wave form distribution of displacement.

EXPLANATION OF THE WAVE-LINE THEORY OF SHAPING WATER-LINES

This theory, and the many modifications of it now in use, is based upon results of tests made, in the first place, by Mr. Scott Russell, a celebrated English naval architect and engineer.

The theory is based upon the assumption that sea waves assume definite shapes, depending upon their velocity, length, and height.

These shapes, geometrically considered, are supposed to be curves of sines of definite shape but differing in length with each change in velocity of wave.

Experiments carried out seemed to prove that the assumption is correct so far as sea waves is concerned; and it was, from this, assumed that if the lines of a boat were formed to conform to a correct wave form for the speed desired the resistance to the passage of the boat through water would be reduced to a minimum.

From the experiments made with waves and models these things were ascertained:

1st.—That the length of fore body (entrance) of a boat designed for a certain speed should be the same as the length of a wave of the first order moving at that speed.*

2d.—That the length of a boat's after body should be the same as the length of the front face of a wave of the second order moving at the named velocity.

The experiments referred to resulted in definite rules being formulated for shaping water-line planes in accordance with the wave theory of form. These rules are given below.

To Shape a Water Plane in Accordance With the Wave Form Theory.—Lay off a straight line the length of the water plane and divide it into two parts by means of a line drawn at right angles to it and placed 60% of the length from one end. This line is called the base line.

*The lengths of waves increase with each increase in speed.

The dividing line is the position at which the midship section must be placed, therefore, the 60% end of the base line is length of bow and the 40% end is length of stern.

On the dividing line describe a semi-circle having a radius equal to one-fourth the extreme breadth of boat on L.W.L. and divide its circumference line into any convenient number of equal divisions, then number the dividing points from No. 1, at base, up.

Now divide the *bow* portion of base line into the same number of parts that you divided the circumference line of semi-circle into, then draw from each dividing point right-angled lines and number them from No. 1, at forward end of base line, up.

Next draw lines through each dividing point of semi-circular circumference line and parallel with base line. These lines will cross each of the right-angled lines and if the points of intersection of each parallel line with the *same* numbered right angle line are used as points for the drawing of a curved line, a correct wave form line for bow can be marked. To lay out the shape of stern portion of the line proceed as follows:

Divide the stern portion of base line into the same number of parts used for the bow and draw right-angled dividing and parallel lines in the same manner you drew them for bow.

Next measure along each parallel line the distance the semi-circular line is away from the *midship section* right-angled line and transfer the measurements *aft* of the correspondingly numbered right-angled line, for after body, by measuring from the right-angled lines the required distance along the proper numbered parallel line.

Thus all the points are moved aft a greater or lesser distance.

If now you use these moved points as points for the drawing of a curved line you will be able to mark the shape of the stern portion of the wave form curve

If you will refer to the upper portion of the No. 34 illustration you will see how the points are moved aft and the curve laid out.

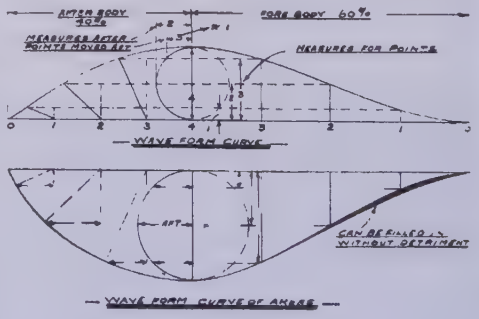


Fig. 34

Technically speaking, the after water-line curve is a *cyclodial* or *trochidal* curve and the completed water-line is a curve of versed sines. In all cases the points should be marked and the bow and stern portions of line marked at one time. Study the illustration.

(To be Continued)

Designs

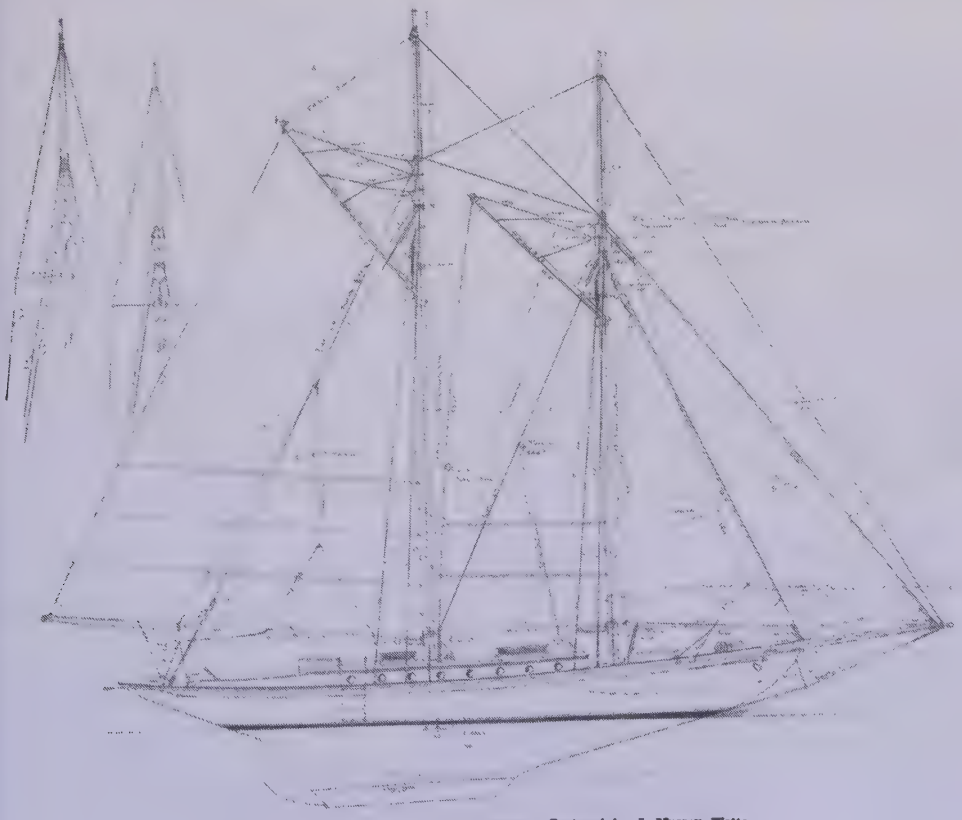
37-Foot L. W. L. Auxiliary Schooner

Auxiliaries are always interesting to yachtsmen, many of whom like the combination of sail and power which gives them a variety of experience. The plans printed herewith are of an auxiliary schooner, 37 feet on the water-line, which is being built for Roger Young, of Philadelphia, from designs by J. Murray Watts. The rig is that of the modern type of polemast schooner with plenty of sail. The model shows a bold sheer, good freeboard, and a very seaworthy type of vessel.

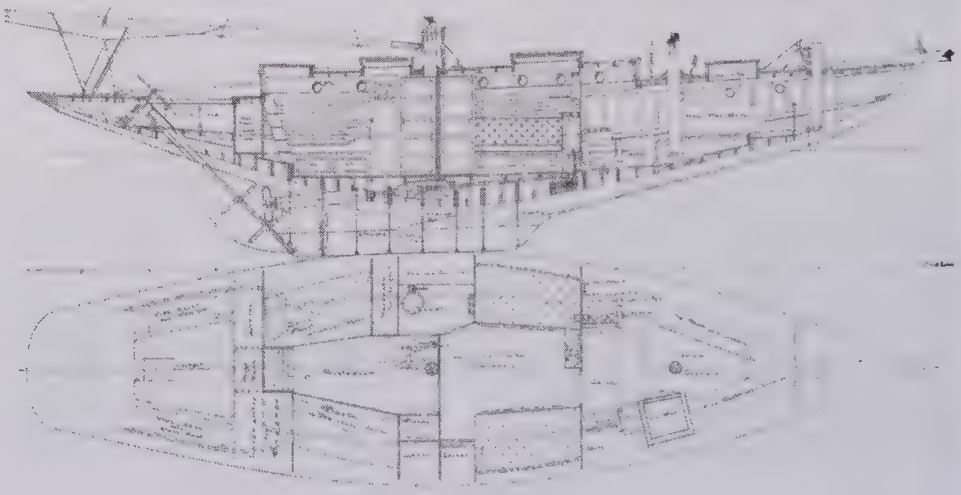
There is a big stateroom aft fitted with two wardrobe lockers, a large baggage rocker, a bureau and two double berths with drawers underneath. Forward of the stateroom on the port side is the toilet room with two doors, one opening into the stateroom and one into the saloon. The saloon has two big transom seats on either side with drawers below, a buffet forward, and a set of companion stairs aft on the other side. A door leads from the saloon into the galley, and there are comfortable quarters for two men forward.

The small auxiliary schooner or yawl is growing fast in popularity and there are indications that when the war is over many will be built, as plans have already been made for vessels from 25 to 40 feet water-line. The small engines used in these boats occupy little space and are now placed so cleverly that they do not mar the interior arrangements of the yachts.

An interesting detail is the layout of the auxiliary engine. The engine is installed on a platform at one side of the forecastle and drives the propeller shaft by



Sail Plan of 37-Foot W. L. Auxiliary Schooner, Designed by J. Murray Watts

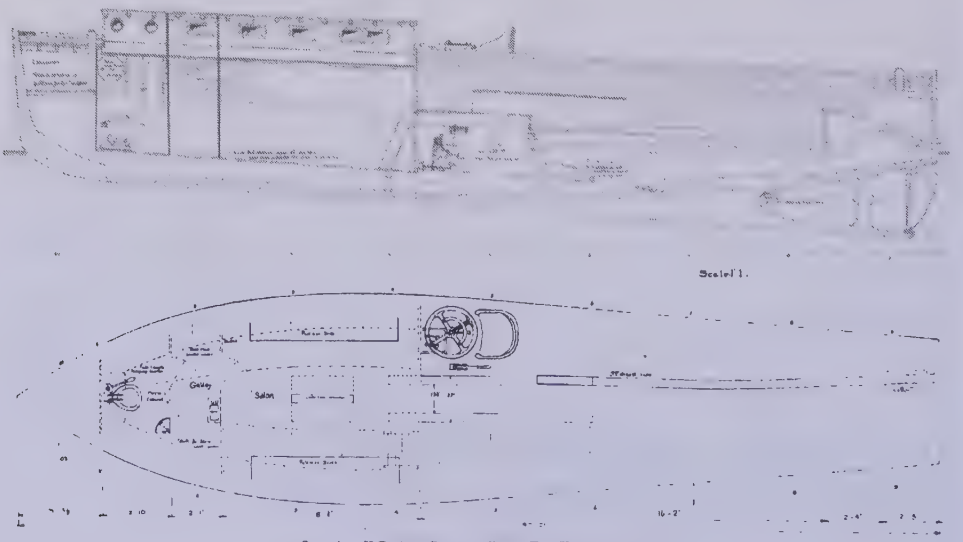


Accommodation Plans of 37-Foot Auxiliary Schooner, Building For Roger Young

means of a silent chain geared down two and a half to one. The propeller shaft is offset to clear the mainmast, and the clutch is installed just forward of the shaft log, with controls leading to the steering cockpit. The engine is a four-cylinder, four-cycle, with electric starting and lighting plant, and all the starting gear is brought back convenient to the helmsman, so that she is easily handled by one man under power without going below, and as all the sheets are also led aft of the cockpit she can also be handled by one man under sail.

The general dimensions are:

Length o. a.	53 feet 0 inches
Length w. l.	37 " 0 "
Breadth	14 " 0 "
Draught	6 " 4 "



Seagoing V-Bottom Express Ferry For Use in Japan

37-Foot V-Bottom Express Ferry

This interesting development of the seagoing V-bottom express ferry is now being built by the largest shipbuilding firm in Japan, from designs and specifications of Wm. Richards, of New York City.

The boat is for use as a ferry between two manufacturing plants, located 25 miles apart, separated by a large bay where there is considerable chop and rough water. The trip is to be made in one hour running time.

As the Japanese require very small galley accommodations and as the weather consists principally of a wet and dry season, the cabin arrangement is merely a shelter, arranged, however, with Pullman berths, toilet and lockers.

It was desired that the power plant be set so that access could be had to it at any time, and with this in mind the type I-6, 100-135-h.p. kerosene burning Van Blerck is placed in cockpit close up to the cabin bulkhead and under a waterproof box, which has hinged covers, sides and ends, or can be lifted clear at any time.

Two cylindrical tanks for gasolene of approximately 100 gallons capacity each are slung under cockpit floor and two similar tanks of same capacity, though of different dimensions, are placed in cockpit opposite engine for kerosene.

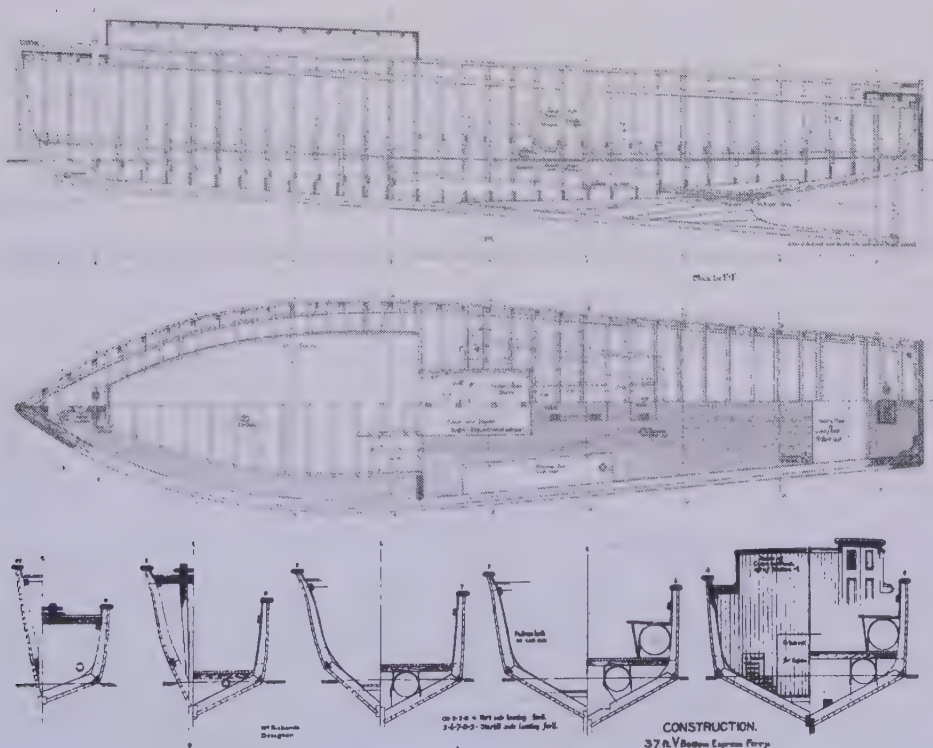
Engine controls are brought to the W. S. Hall vertical type, scored drum steering wheel, while reverse lever is just at the steersman's left hand. A Stewart tachometer is placed in cabin bulkhead side of the binnacle; both are easily read from steering position.

The starting and lighting are through twelve cells of Willard 24-volt, 35-ampere storage batteries, with marble switchboard mounted on inside of cabin bulkhead.

The watertight cockpit is well above the waterline, draining aft, through two very large scuppers. There is a watertight hatch in cockpit floor over both the coupling to tail shaft and the inside stuffing box.

The lazy-back and stern seat are instantly removable so that attention to the steering gear is not delayed in any way.

Special strut and rudder equipment designed by Mr. Richards are being shipped for the boat, by the



Construction Plans of 37-Foot Ferry, Designed by Wm Richards

Columbian Brass Foundry, and Durkee is supplying the balance of the fittings under Mr. Richards's directions.

The Richards outboard opening, weatherproof port lights, so popular where square ports are required, are being built for this boat by the shipbuilding firm.

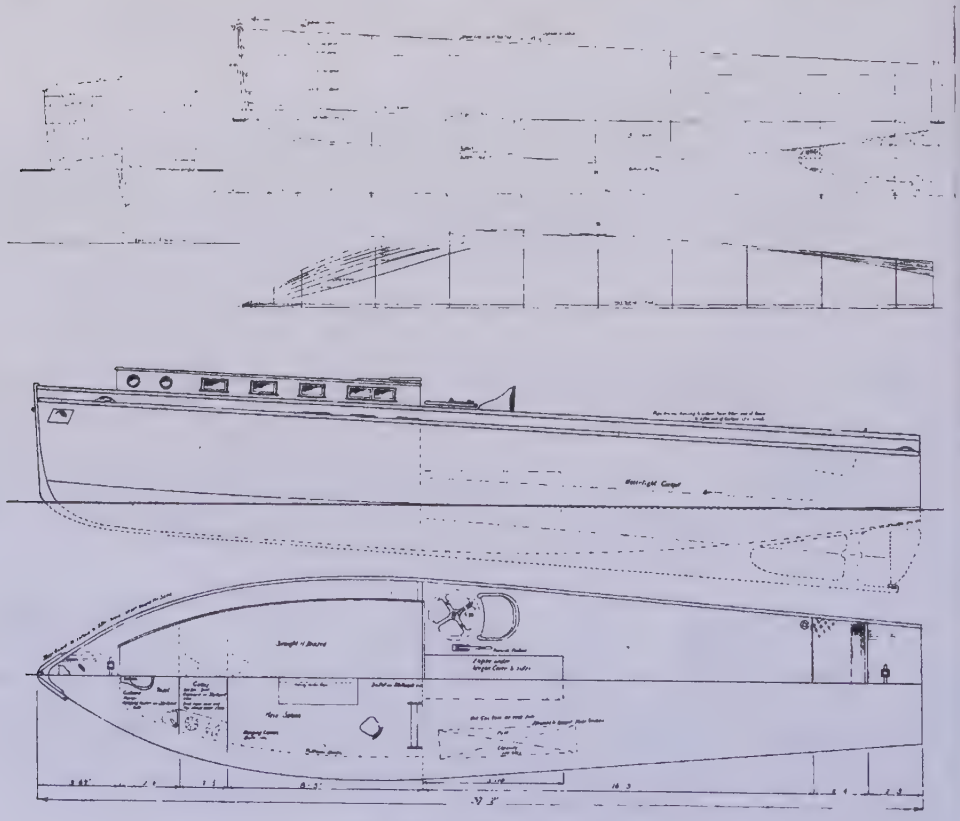
The speed guarantee, though not excessive, was carefully worked out and a report with photos will be published covering the performance of this boat, at an early date.

Considering business conditions at this time, when every one is rushed and orders are hard to deliver even with the best of intentions, it is worthy of note that the design of this boat was started January 17, 1917, accepted and mailed, instruction and specifications cabled and all other business pertaining to special fittings cleaned up on February 1st, with all goods comprising the many small and time-taking details and special bronze work, and other fittings all ready for shipment on the guaranteed date of February 15th.

North River Schooner

There is always a fascinating interest in any old type of vessel no matter how homely or how humble its trade. The North River sloops and schooners have always been attractive as they sailed up and down the Hudson River generally with a cargo of brick, and its complement would not be complete without a dog on board.

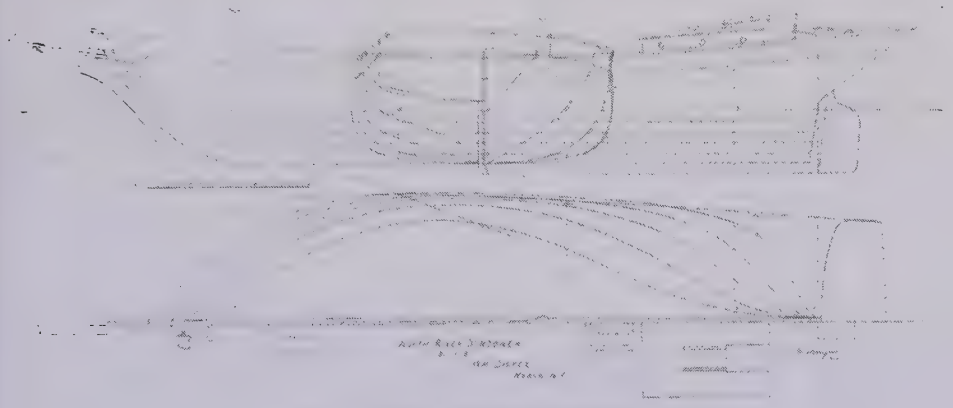
George B. Douglas, whose hobby is collecting plans and particulars about all types of vessels from all parts of the world, some time ago discovered some half-models in the hayloft of a barn near Nyack. The models had been the property of William Dickey, an old shipbuilder of Nyack, who died about 1890, having rounded out eighty years. Mr. Douglas showed the models to Captain Moses Collyer, who wrote "Sloops of the Hudson," and Captain Collyer said they were fair samples of the old-style vessels. Mr. Douglas worked out the lines of a sloop and a schooner from the models and then worked out the sail plans from particulars given by Captain Collyer. The lines of the sloop were published in THE



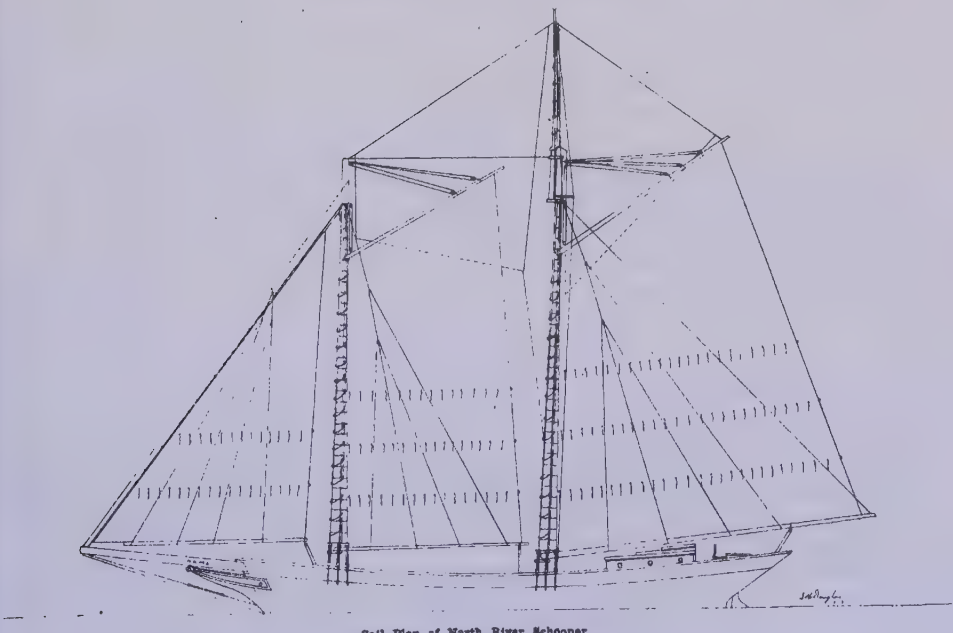
Lines of 37-Foot V-Bottom Express Ferry

RUDDER of April, 1916, and the lines and sail plan of the schooner are given herewith. In the days when these vessels were built the builders did not trouble much with inches, as the dimensions which follow show.

Length o. a.	77	feet	
Length on w. l.	64	"	
Breadth	24	"	
Draught	7	"	
Foremast, deck to cap	59	feet	
Main mast, deck to cap	60	"	
Main topmast, o. a	27	"	
Boom, main	48	"	
Boom, fore	27	"	
Gaff, main	29	"	
Gaff, fore	26	"	
Bowsprit, outboard	24	"	



Lines and Sections of 77-Foot North River Schooner



Sail Plan of North River Schooner

60-Foot Express Cruiser Muirmaid V

Muirmaid V, which has been built for Pierre A. Proal at the Red Bank Yacht Works, was designed by J. Murray Watts, of Philadelphia. The model is of the V-bottom, wave-collecting type, which has proved successful in patrol boats which are now in the naval service. The outboard appearance shows a good, high-sided, seaworthy type of vessel, with the engine room ventilated by a large stack, and a good size steering bridge just forward of amidships.

The arrangement plan is very simple, consisting of a large double stateroom forward with connecting toilet room, a very roomy saloon aft, and a large galley forward of the saloon. The crew's quarters with bunks for four men are under the bridge deck.

All the outside joinerwork is best Honduras mahogany, and the owner's quarters are finished in white enamel paneling trimmed with mahogany. The bathroom, toilet room and galley are finished in tiling.

The Muirmaid V is equipped with an eight-cylinder, 5½ by 6¾-inch Sterling engine of 150 h.p.

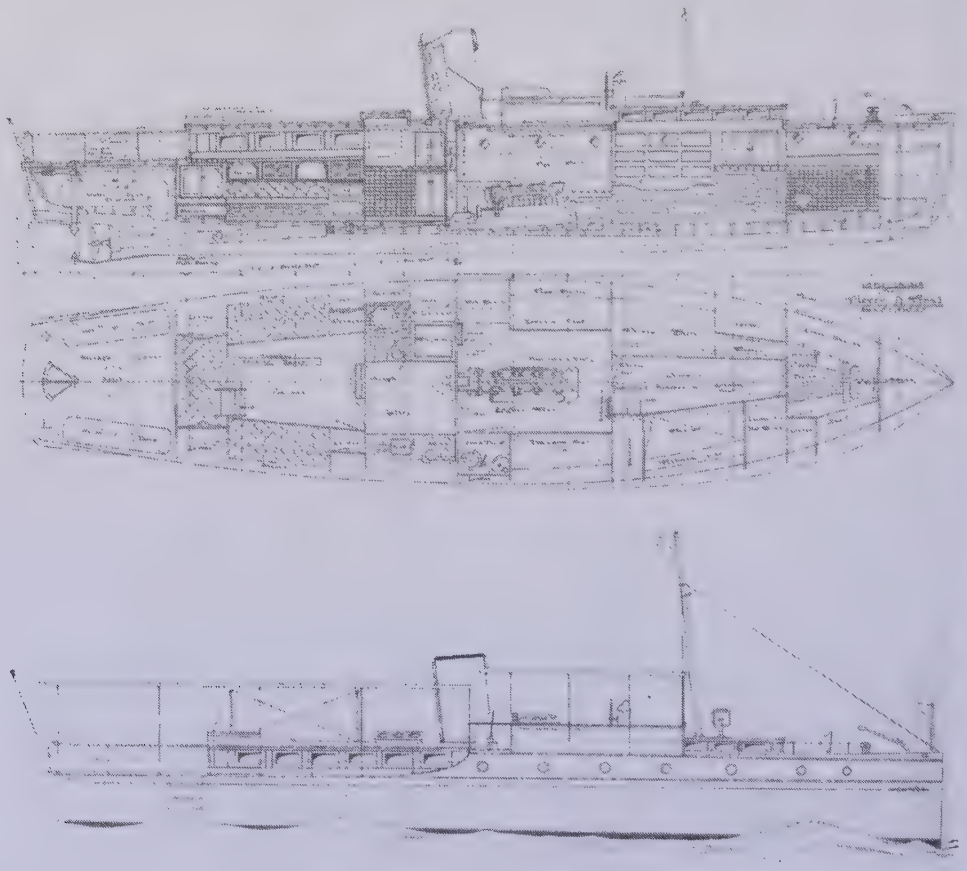
The general dimensions of the yacht are:

Length o. a.	60 feet
Length w. l.	50 "
Breadth	14 "
Draught	3 "

A 35-Foot Florida Club Launch

A very interesting boat has been recently built from plans by Wm. H. Hand, Jr., and launched by Merrill & Stevens, at Jacksonville, Fla., for members of the Canaveral Club of Titusville.

This boat has an open tunnel and shows surprising



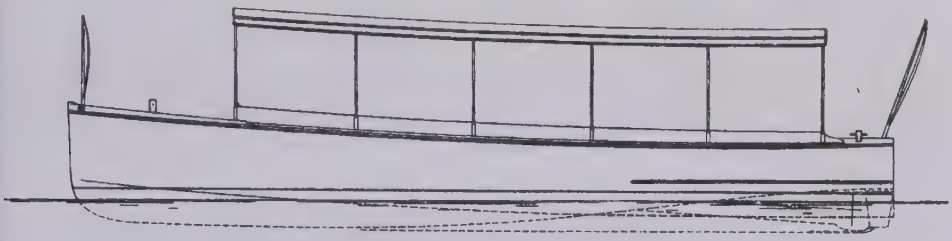
Muirmaid V, Building For Pierre A. Proal. From Designs by J. Murray Watts

speed in both deep and shallow water. The power plant is an E-4 Van Blerck installed amidships, with electric starting and lighting, and the extreme draught under the propeller is 15 inches.

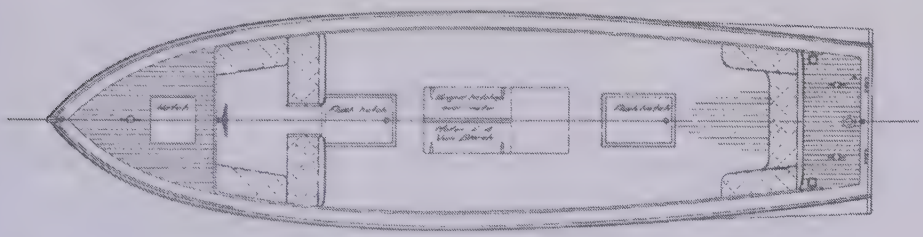
The boat is used for general ferry purposes and has proven most satisfactory in service. The arrangement provides an unusually long and conveniently arranged self-bailing cockpit over which there is a permanent awning with storm curtains for use in bad weather. The boat is pleasing in appearance and the type is one which can be recommended for use on shallow waters, especially where it is necessary to occasionally go on open water, which requires a seaworthy form.

The general dimensions are:

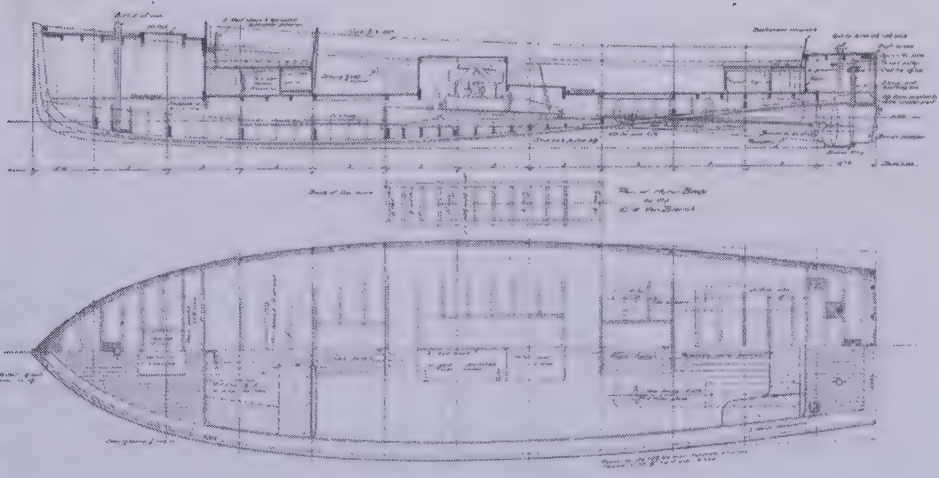
Length o. a.	35 feet 0 inches
Breadth	9 " 0 "
Draught	1 " 3 "



35-Foot Club Launch For Canaveral Club



Arrangement Plan of 35-Foot Club Launch



Construction Plan of Launch, Designed by W. Hand, Jr.

Chicagoan—60-Foot Patrol Cruiser

A 60-foot patrol cruiser is now building at the works of the Great Lakes Boat Building Corporation, Milwaukee, for William H. Stillwell, of Chicago, who has already entered his boat in the Patrol Squadron Fleet.

Mr. Stillwell's 60-footer is somewhat similar in general appearance to the 110-foot submarine chasers which the Navy Department has recently ordered. This design recommends itself for the reason that it permits great structural strength in the fore-and-aft stress members.

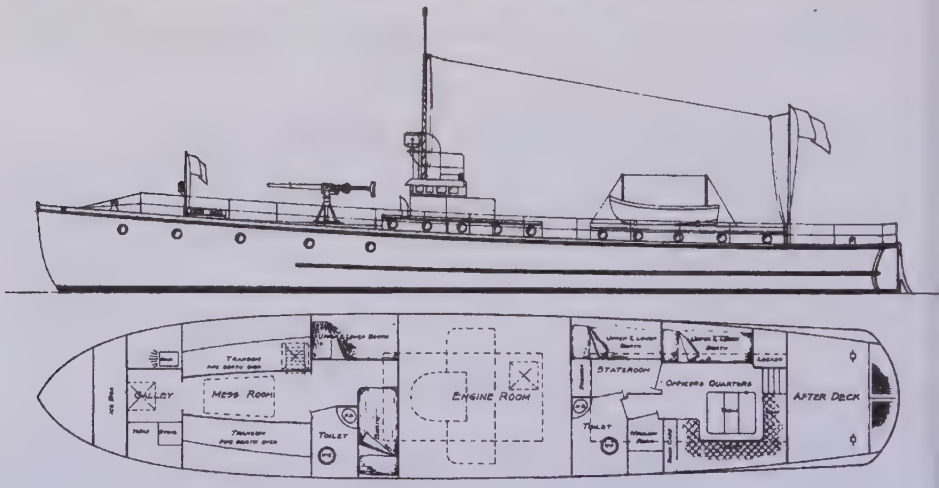
The arrangement plan contemplates six compartments; galley in forepeak, followed by crew's quarters, petty officers' quarters, engine compartment, captain's stateroom and junior officers' quarters,—the design being so worked out as to give very large deck space, which is highly desirable. The main ornament, which is to consist of a six-pounder, is carried forward of the conning tower on a heavy foundation, reinforced to the frames and carried to the keel with pipe stanchions, in accordance with the latest and best practice. The galley, forward, is complete in every respect.

The crew's quarters, following the galley, are arranged with two transom berths and two pipe berths. Adjacent to the crew's quarters, and separated by a curtain, provision is made for three built-in berths for petty officers. The connecting lavatory is completely equipped with toilet and wash-basin. The engine room, amidships, has full headroom throughout, and is separated from the compartment forward by a watertight bulkhead. The power plants are controlled in the engine compartment, by direction from pilothouse, through telegraph and speaking tubes. Ample ventilation is obtained by means of ventilators looking forward and aft.

The bridge deck, over the engine compartment, is protected with approved conning tower, which is arranged with lookout position on the roof. A steel mast is provided to carry signals and wireless equipment. A 9-inch Carlisle & Finch searchlight is mounted directly over th conning tower and controlled by the helmsman.

The captain's stateroom is provided with built- upper and lower berths and arranged for direct entran to completely equipped toilet on port side. The junic officers' stateroom is aft, furnished with upper and lowe berths on the starboard side and a bookcase and loun ing seat on the port side. Both of these staterooms a finished in white enamel with mahogany trim, so th no alterations will be necessary when it is desired to u the cruiser as a pleasure yacht. Adjacent to the officer quarters is a wireless room, properly lagged.

Mr. Stillwell's patrol cruiser will be powered wit two eight-cylinder, 6 by 6-inch Van Blerk engines, whic will give her a speed of 24 miles per hour. While M Stillwell lives in Chicago, his boat will be entered in th Third Naval District at New York.

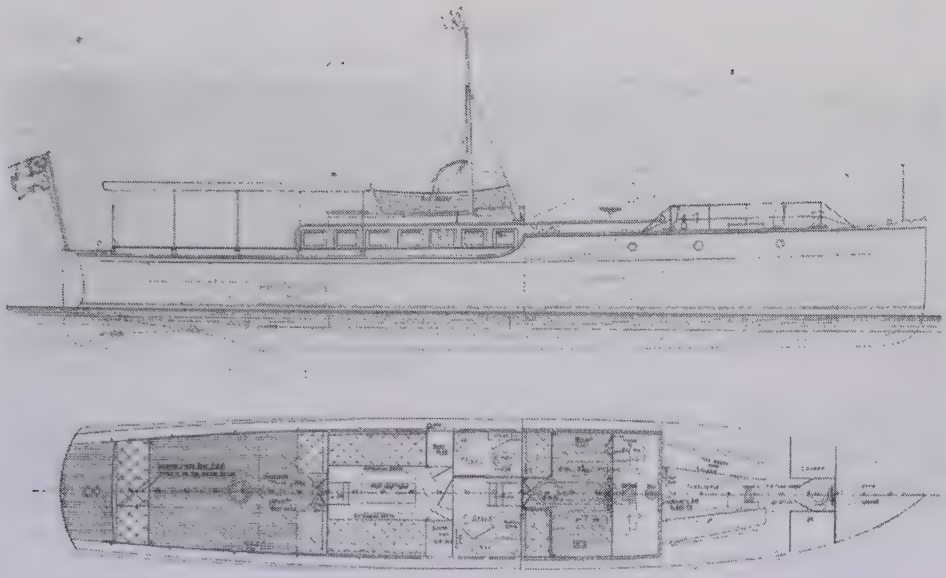


60-Foot Patrol Cruiser, Built by Great Lakes Boat Corporation, For W. H. Stillwell

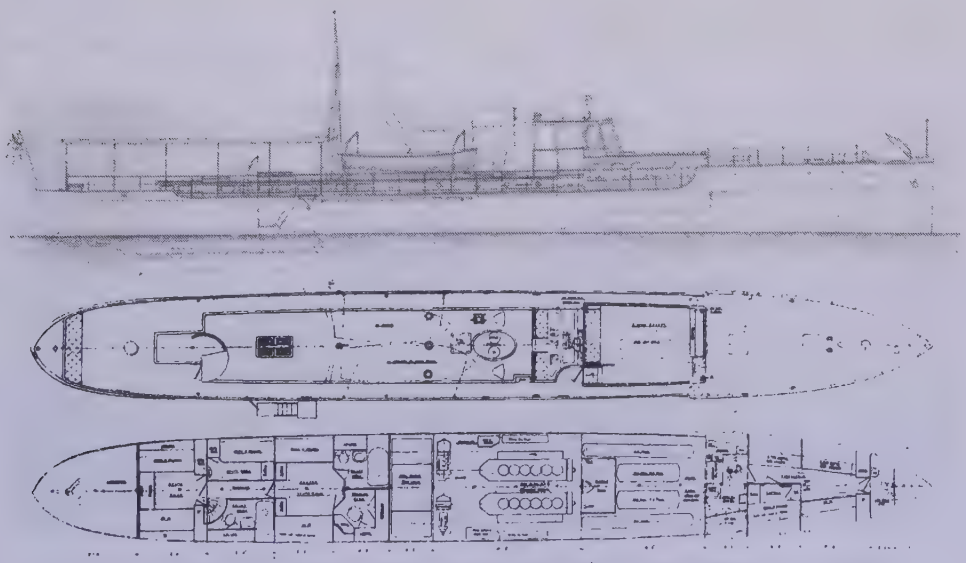
Little Viking, Com. G. F. Baker's Yach

Commodore George F. Baker, Jr., will use a sma power yacht this Summer instead of his steam yac Viking. He has purchased Gwen II, which has bee built by the Gas Engine & Power Company at Morr Heights for John McCormack, and will name the yac Little Viking. On a length of 57 feet and breadth 10 feet, excellent facilities for comfortable short tri have been arranged, while the accommodations provide are adequate for a limited number of persons, makir possible week-end cruises. The Little Viking makes 23 miles an hour.

The design shows a well-turned hull of powerf and speedy lines. The construction is the usual, oa keel and frames and brass screw-fastened cedar plan ing. All interior and exterior joinerwork is mahogan finished bright. Under the raised deck is a roomy for castle, which has pipe berths, lockers and lavatory co



Profile and Arrangement Plan of Little Viking, Recently Purchased by Commodore Geo. F. Baker, Jr., N. Y. Y. C.



Profile and Arrangement Plan of Privateer, Built by Gas Engine & Power Company For Dock Commissioner E. A. C. Smith

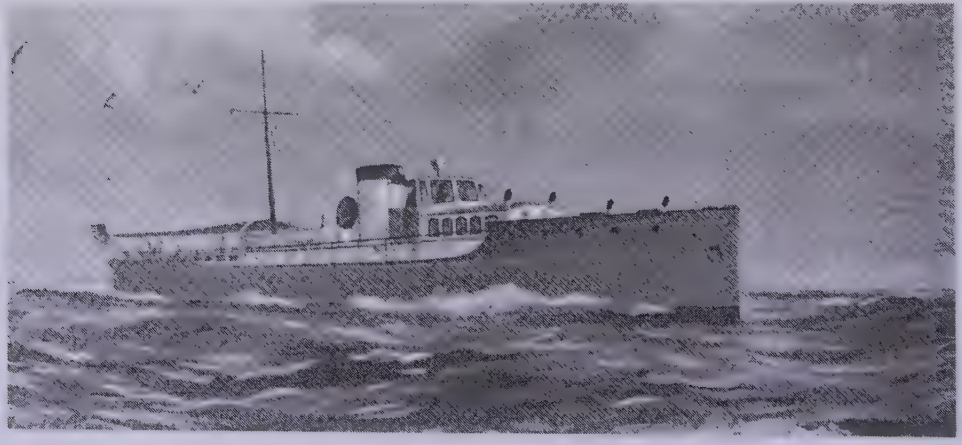


Little Viking, Formerly Gwen, Which Commodore Geo. F. Baker, Jr., Recently Purchased for Use This Season. Built by the Gas Engine & Power Company. Length 57 Ft. and With Two Speedway Engines Makes 23.8 M.P.H.

veniences for two men. The two six-cylinder, 5¾ by 7-inch Model M Speedway engines, complete with electric starting and lighting appliances, are installed forward, extending under the steering cockpit. These engines are identical in design with the eights which power the record-breaking twin-screw sister cruisers, Raven III and Shadow III, which made such enviable records in the recent Miami Regatta, each racing a total distance of more than 1,000 miles in about two weeks.

Two upholstered divans of generous dimensions, together with wardrobes, book shelves, buffet, dining table and the like comprise the cabin furnishings. To the starboard of the companionway which leads to the bridge deck, a commodious and convenient galley is arranged. The equipment includes a sink, large ice-box, Speedway alcohol range, etc. The lavatory is directly opposite, with the necessary fittings, all of excellent manufacture. One of the most attractive features of the new yacht is the large outdoor space. In the after cockpit sufficient space for eight chairs is found, which, with the stern lazyback and the shelter seats on either side of the companionway, offer splendid facilities to entertain a large party.

Mr. McCormack has placed an order for a Speedway runabout, his fourth Speedway boat.



Privateer, Built For Hon. R. A. C. Smith, by Gas Engine & Power Company. Length 108 Ft., Breadth 13 Ft., Draught 4 Ft. 10 In. Equipped With Two 8-Cyl. 11-In. x 12-In. Speedway Engines of 250 H.P. Each; Speed 22 Miles

Privateer Nearing Completion

Privateer is one of the latest boats built by the Gas Engine & Power Company at Morris Heights. The keel was laid in March and the yacht is now nearing completion. She was ordered by Dock Commissioner R. A. C. Smith, to be used in local waters, but has been taken over by the Government and will be used in the patrol fleet. As the yacht was taken before being finished such changes as the Navy Department think necessary are made without tearing the vessel to pieces as has been done in so many instances.

The yacht is built of wood, two thicknesses of yellow pine being riveted over oak frames. Steel sheer-strakes, bulkheads and web frames are used to great advantage, materially strengthening the hull. The engine trunk is of steel, following the usual practice of steam yacht construction.

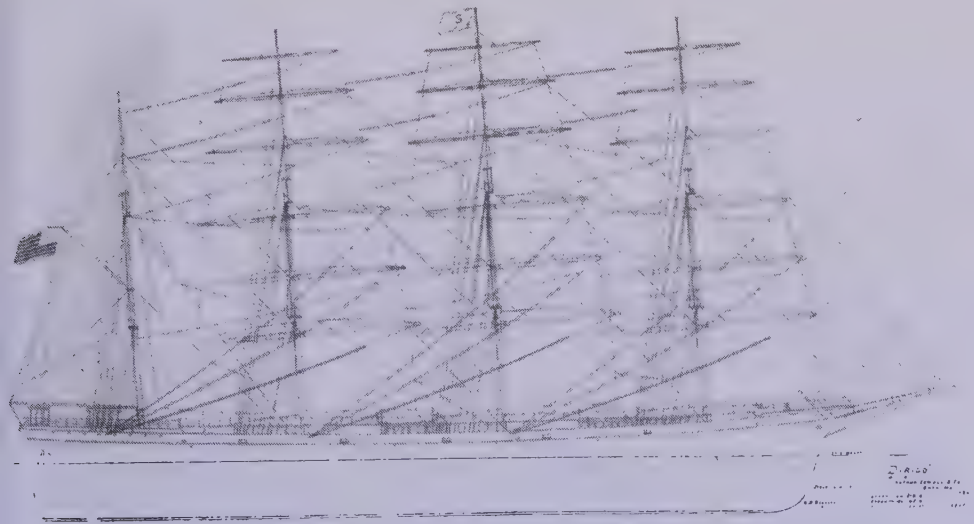
In general appearance the Privateer is not unlike a torpedo-boat. The stern, while not an exact counterpart of the type which it represents, is a development which will prove its worth under all conditions of weather. The topsides forward are built up, allowing unusual but not excessive freeboard. Here are located the crew's quarters and galley, consisting of berthing space for seven men, exclusive of a stateroom for the captain. The galley includes in its complete equipment the latest appliances, nearly all of Speedway manufacture. Following the rather rakish bow a deck saloon is built, which, with appropriate style, carries out the straight-line effect of the hull. The dining saloon and the lounge are here located.

A feature deserving of note is the windshield. It is strikingly original in design and despite its conspicuousness, is most pleasing in appearance. It is built conical in shape, of five sections, the forward one having a decided rake aft while the side sections show a slight tumblehome. The upper half of the center part hinges forward and is adjustable to various positions by means of quadrants.

The side decks are of ample width and the spacious stern provides splendid accommodations for steamer chairs and lounging seats. The owner's suite consists of a commodious stateroom with two regular full-width berths. A complete bathroom adjoins and is so placed as to have direct communication with the dressing room as well as the stateroom. The finish in these quarters is solid mahogany with simple furnishings of extra good quality. Another double stateroom is arranged at the aftermost section of the accommodation space, directly forward of which on the port side is a single stateroom with a bathroom opposite. A curved stairway gives access to the deck. The companionway hatch is an excellent example of simplicity. It is built to a segment of a circle, pivoted, and needs but one slide runner.

Two Speedway, six-cylinder, 11 by 12-inch engines, developing 250 h.p. each, the most powerful gasolene units now obtainable, are installed, following the best possible practice. The engines are of the air-starting and reversing type, which have had unusual success in the largest power yachts, and are identical with the installation furnished Mr. Wm. K. Vanderbilt, Jr.'s Tarantula, W. Earl Dodge's new triple-screw Sabalo, and the 110-foot yacht now building for Perry Bartram. The auxiliaries consist of a separate Speedway, driving air compressors, fire and bilge pumps and a six-cylinder Winton electric generating set. The gasolene tanks, located in a separate compartment directly aft of the engine room, have a capacity of 2,010 gallons, assuring a large cruising radius. Two boats will be carried, a Speedway Jr. tender and a 14-foot dinghy.

The Privateer is probably the largest fast yacht of the year, for a speed of 22 miles per hour is expected will be easily attained. The length is 108 feet, breadth 13 feet, and the draught 4 feet 10 inches.



Sail Plan of Ship Dirigo. Recently Sunk by a German Submarine. Length 310 Ft. Built at Bath, Me. Drawn by G. B. Douglas

Rudder Designing Competition

SEVEN very good designs were sent in for the competition for a 40-foot shoal draught power cargo boat, and the judges, Henry J. Gielow, the well-known naval architect, Clifford D. Mallory, yachtsman and steamship man, and the editor of THE RUDDER have at last been able to get together and determine which designs are entitled to the prizes offered. These prizes were $35 for the best, $20 for the second best, $10 for the third best, and one year's subscription to THE RUDDER for each of the other competitors.

Taken as a whole the designs submitted were remarkably good and each one had some distinctive feature which commended it so that it was rather difficult to place them in order of merit.

The seven designs were sent in by W. G. Benzanson, 1697 Atlantic St., San Diego, Cal., and George Chalker, Y. M. C. A. Building, San Diego, Cal., who collaborated and entered under the sign of a flower; Edwin Monk, Thomas King Company, Washington, who signed his plans "Will Jones"; F. E. Seibert, 113 Medbury Ave., Detroit, Mich., who signed "Marlin Spike, Jr." These three took the prizes in the order named. The others were Carroll J. Cobb, 122 Princeton Dr., Toledo, O., "K"; Clarence Henry Crowder, 199 Pearl St., North Weymouth, Mass., "H"; William F. Gilliam, 164 Moss Ave., Oakland, Cal., "710"; and R. A. Polhamus, 1434 East 65th Place, Chicago, Ill., "Polly."

The combination of Mr. Gielow and Mr. Mallory, representing respectively the technical and the practical ends of designing and building, was a particularly happy one for this competition.

Commenting on the winner Mr. Gielow said the general arrangement was very good but the model was too boxy. There was not enough deck room aft and the hull was too broad and flat aft but these errors could be very easily corrected. Mr. Mallory said the plans were very good and the bulwark was a good feature. The freeboard could be a little higher as the cargo hold is very low and of little use for the stowage of any large packages.

The general dimensions of the winning design are:

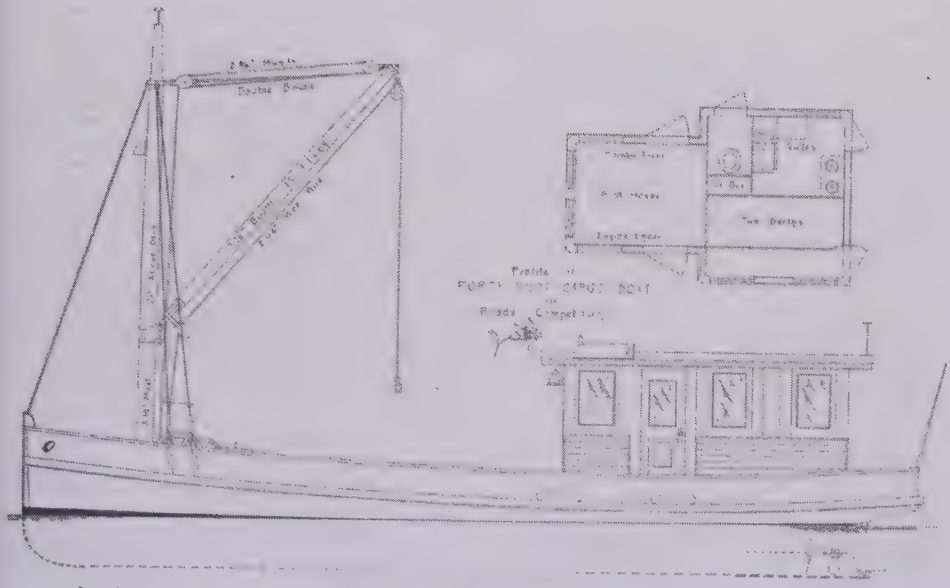
Length	40	feet	0	inches
Breadth	13	"	3	"
Draught	0	"	30	"
Draught, light	0	"	18	"

Capacity for freight is 12 tons.
Derrick capacity 5 tons.
Fuel tanks 250 gallons.

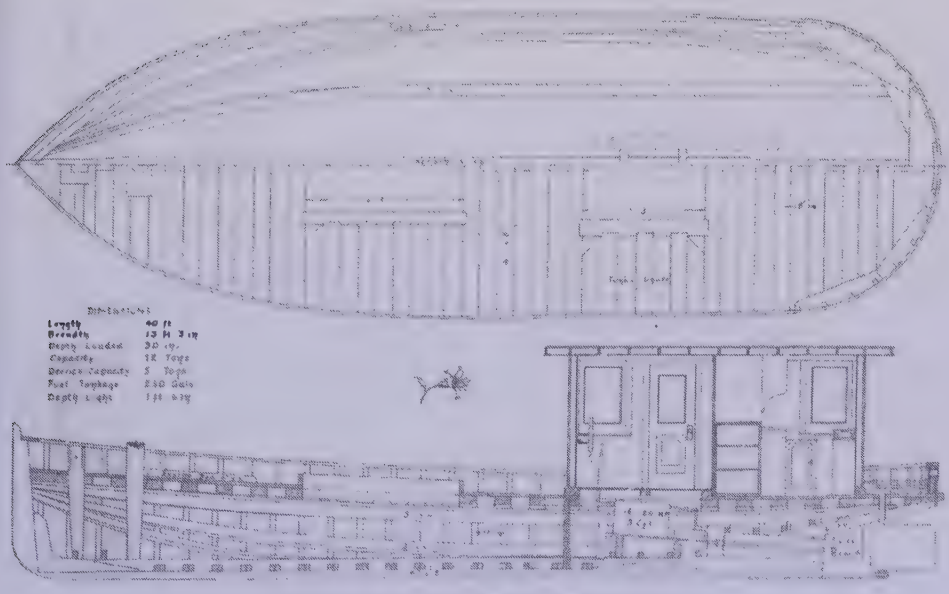
The conditions required a shoal draught boat, length over all not to exceed 40 feet; breadth, no restrictions



First Prize Winner in The Rudder 40-Foot Cargo-Boat Competition; Won by W. G. Benzanson and George Chalker



Profile and Arrangement Plan of First Prize Winner



Construction Plans of Prize-Winning 40-Foot Cargo-Boat

nor limitations; draught not to exceed 30 inches. The boat to be driven by a heavy-duty engine of from 15 to 25 h.p., to have sleeping accommodations for two and a galley of sufficient size to supply the needs of two. The cruising radius should be 300 miles.

The second prize winner shows a very good model but the pilothouse is placed too far aft, not allowing for towing bitts, which should be forward of the propeller. The large hatch is good. The wire rail is not necessary, a low bulwark would have been better.

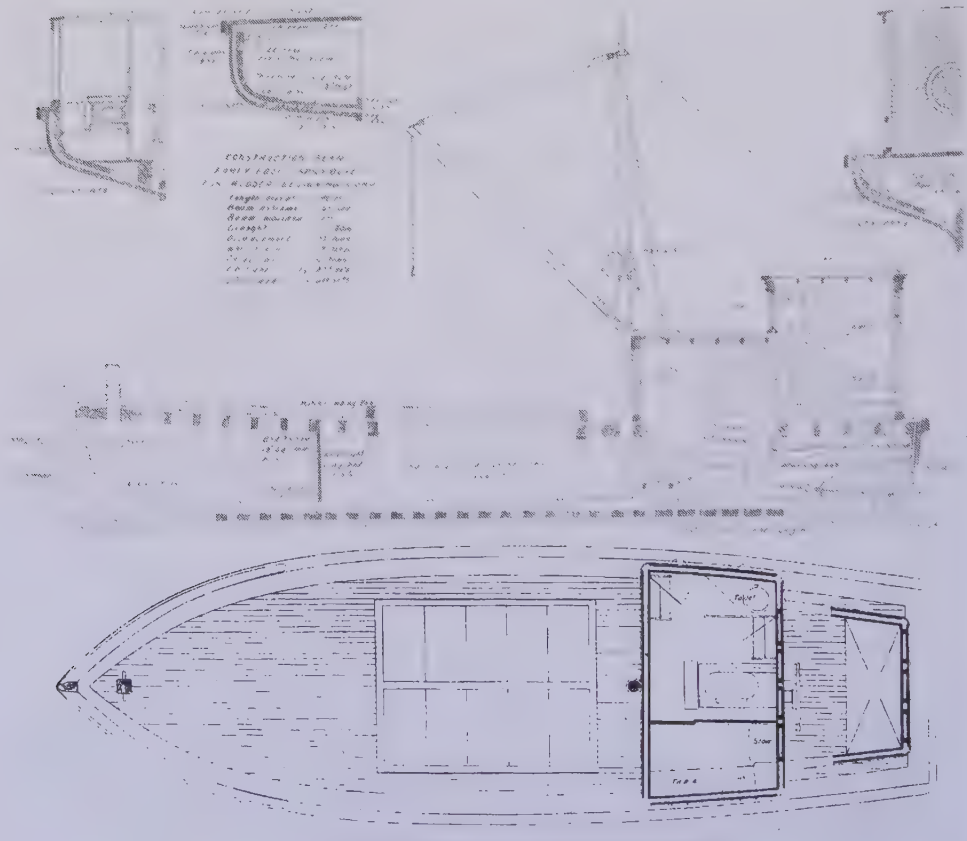
The general dimensions of second prize winner are:

Length	40 feet 0 inches
Breadth	12 " 10 "
Breadth, moulded	12 " 0 "
Draught	0 " 30 "

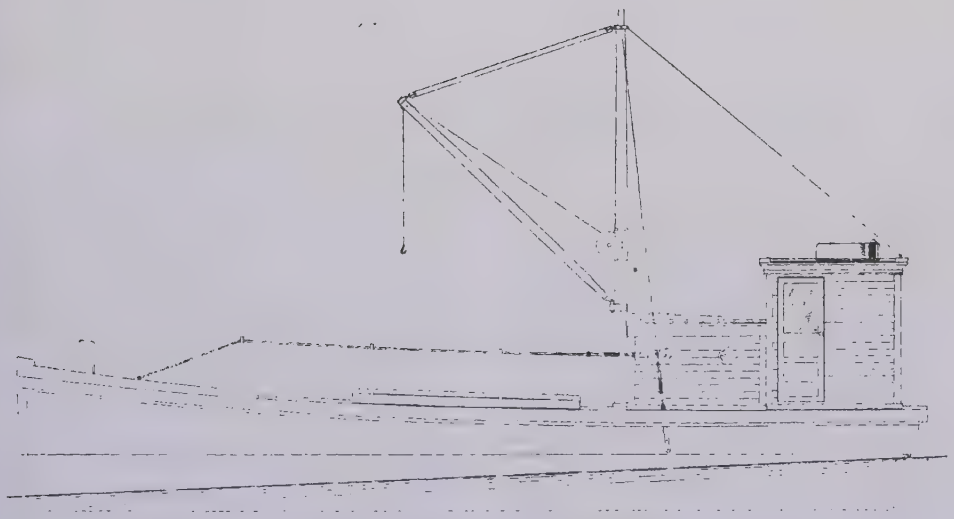
Displacement 17 tons.
Weight of hull 7 tons.
Cargo capacity 10 tons.

The third prize winner shows a boat well suited for river work and carrying light freight that is not heavy to handle. It is especially good for the protection of the cargo. The steering wheel is too low for the location and the after bitts should be further forward. The model is rather an expensive one to construct having considerable flare forward, and the tunnel stern also adds to the cost and difficulty of building.

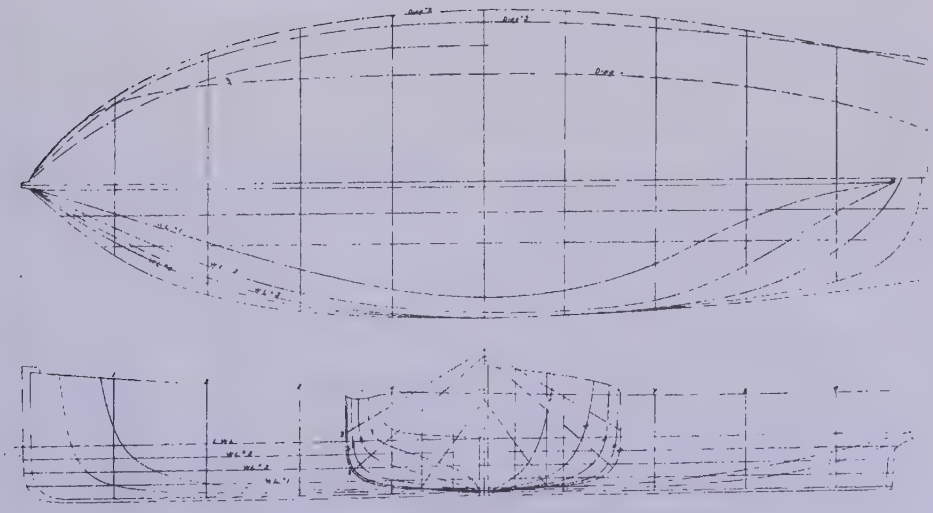
In some of the other plans the lines are too fine and more suited to a pleasure craft than to a cargo boat. There would be generally in such boats too little hull space. This criticism particularly applies to the boat submitted by Mr. Polhamus, whose plans were very complete and well drawn. The first and second prize winners are presented in this month's RUDDER and other plans will be published from time to time until all are used, so that those interested in designing may have opportunities to study them.



Second Prize, Rudder Competition, Won by Edwin Monk, Washington



Profile Plans of Second Prize Winner in Rudder Competition



Lines of Second Prize Winner in 40-Foot Cargo-Boat Competition

Racing Begins on the Delaware

By J. Kinzer Shell, Jr.

THE power-boat season of 1917 in the United States was officially opened on Saturday, June 9th, with the cruiser contest of the Riverside Y. C., of Essington. Despite the activities of the War Department and the preparedness of the Naval Coast Defense Reserve in the Fourth Naval District, fourteen of the representative racing cruisers belonging to members of the many clubs on the Delaware River from Trenton to Salem, took part in the 32-nautical-mile contest, which was held under the new rules and regulations of the A. P. B. A.

Despite the fact that the racing rules of the A.P.B.A. call for a cruiser race of at least 50 nautical miles and at sea if possible or in waters where the elements test the capabilities of the competing cruisers, the performance of the fourteen boats, varying in size from the 30-footer to the 60-footer, proved that the new racing rules are good. The rules are undoubtedly better in a large measure than the ones under which the boats have raced for the last five or six years. Where under the old rules the boat with a low rating generally, unless something unforeseen happened, won whenever she started, the case was just the opposite in the opening event. The boat near the scratch mark has just as much chance in winning any sort of cruiser race, whether long or short in duration, as the low rated boat.

In the majority of cruiser races held last year in the section comprising the Delaware River and also in the two divisions, one on Barnegat Bay and the other on the South Jersey Coast from Atlantic City to Cape May, the boat with a low rating was a winner. It was just a matter of being interested in the game and an endeavor to make the best time that kept the owners of the high rated boats in the game. For instance the Bedouin, owned by Jules Levy of the Riverside Y. C., one of the low rated boats, won every race in which she started excepting one, which went to a boat rating lower than herself. It was generally the case at the conclusion of a contest to score the first four boats as low raters with exceeding high time allowances.

Under the conditions which prevailed at the time of the contest, the rules and regulations were not given as fair a consideration as was deemed advisable by the racing commission of the A. P. B. A., which got up the regulations, after deliberate consideration of the performances of the boats last season, taking the consistency of the boat with and against tide under normal and abnormal conditions. The average upon which the present set of rules was made, was arrived at in this manner. In order to give the rules as good a chance as possible to make good, sportively speaking, the regatta committee of the Riverside Y. C., under the direction of Commodore Charles Walber, the leading light in power-boat circles on the Delaware River, decided to hold the race first against and with the tide. This had to be done as the Navy Department has placed a certain area on the river under restriction. Each boat had to buck the tide and then had things easy coming home, in this manner the average was reached and things equalized.

The Helen T., owned by Charles Townsend of the Wissinoming Y. C., was the winner of the contest by less than four minutes. He actually beat the Gypsy, owned by Dr. F. C. Southern of the home club, the Riverside, on corrected time by 3 minutes and 22 seconds. The Gypsy, with a rating of two and a half points higher than the Helen T., upon getting the starting signal was well up river and it was 3 minutes and 23 seconds before she crossed the starting line after the flag and number had been reached. If the Gypsy, with one of the best navigators on the river, at the helm, had come up to the starting line when the number and flag were raised a minute before her actual starting signal, she would have won the contest by a second, as corrected time figures show.

The Mascot, owned by Charles Heiber, of the Columbia Y. C., was third across the finish line and captured third time prize. The Annie M., owned by E. Benson of the home club, the limit boat, was fourth, just 16 seconds ahead of the scratch boat, the Lady Jane II, which finished two seconds in the rear of the Marie Victoria, owned by E. C. Buzby. When it is taken into consideration, that the three fastest boats of the fourteen finished, second, third and sixth and but seconds separated the scratch boat, the new rules show that things have almost been equalized and better doings can be expected in power-boat competition this Summer.

A complete summary of the contest follows:

SUMMARY

Boat and Owner	Rating	Allowance H. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Helen T., C. Townsend	33.29	34:36	4:13:06	3:38:30
Gypsy, Dr. F. L. Southern	35.81	17:11	3:59:03	3:41:52
Mascot, C. Heiber	35.18	21:42	4:05:30	3:43:48
Annie M. II, M. E. Benson	29.94	1:01:58	4:58:28	3:56:30
Marie Victoria, E. C. Buzby	32.66	38:58	4:35:42	3:56:44
Lady Jane II, Mrs. J. C. Sides	38.86	Scratch	3:56:46	3:56:46
Admiral, T. Kelly	35.64	19:07	4:27:34	4:08:27
Acushla, W. O'Donnell	36.02	15:45	4:25:52	4:10:07
Lynda II, J. W. Cook	34.69	24:59	4:36:13	4:11:14
Charalda, Olwell & Roberts	32.55	40:28	4:57:20	4:16:52
Eyre S., Smith & Anderson	32.72	38:58	5:04:24	4:25:26
Mabel, G. Speyer	36.64	12:20	4:42:32	4:30:12
Ethel Mack, J. H. Massey	38.80	:30	4:43:13	4:42:43
Dora II, B. Aireshoff	30.05	1:01:02	Disqualified	

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

The Grammar of the Sea

Editor of THE RUDDER:

It may sound rash to maintain that the English language in matters of the sea is more correctly used by even the illiterates of those who make their living at sea than by educated people who may be even intimately connected with things nautical, and this assertion would not be made if it could not readily be fully proved to be correct.

This proof is that nautical terms, like all others, are definite parts of speech and you rarely, for example, hear one of the sea use the same word indiscriminately as an adjective and as an adverb, for there are enough of each to supply his needs for either and, though he may know no rules of grammar, you can generally parse his expressions and that, it is maintained, can rarely be done in the case of the speech or writings of others.

To illustrate the contention there will be used excerpts from an article which appeared in a well-known yachting journal which was written by a man almost as well known as the magazine for which it was written but, that the publication and the writer may not be too easily identified, the example selected is one of several years ago and the letters "A" and "B" are substituted for the names of the yachts in the race of which the article is a description.

* * * "A" was up to *weather* of the buoy and had to jibe before she could cross.

From any dictionary it may be seen that while "weather" is sometimes a noun, again an adjective and in some cases a verb, it is never an adverb as it is here employed. With a perfectly good adverb to hand, one which from its form is an adverb, there is absolutely no justification for overworking some other part of speech to serve as one. Any sailorman, no matter how illiterate, would not have failed to say that "'A' was up to *windward* of the buoy and had to jibe," etc.

As the squall passed "A" got a shift of wind *westerly* and came about quickly.

As *westerly* is never anything else than an adjective, why use it too as an adverb of place or direction as long as the dictionary contains the perfectly satisfactory adverb "westward" and say "'A' got a shift of wind from the westward," or, probably more correctly, say, "After the squall passed the wind shifted to the westward and 'A'," etc.

Finally "A" drew ahead and ——— (her captain) tacked on "B's" *weather* and for the first time in the race ——— boat was ahead.

In reading this, one is almost tempted to give up the English language, "as she is spoke." Tackle this sentence as you will and *weather* in this context can be nothing but a noun and as such "A" must have tacked on something decidedly fickle.

Both swung at once to starboard tack, "B" eating out to *weather* and "A" footing faster.

Poor old *"weather"!* Used again without regard to our old friend, Lindley Murray; and why not put the article "the" before the adjective "starboard"?

The two boats made one long tack to the Northeast, then came about and stood down for the *windward* mark * * *

According to most textbooks on grammar, adverbs are used to qualify verbs, adjectives and other adverbs, and one would think this work enough for any one part of speech. Certainly it seems a bit too much to call upon one of them to qualify the noun "mark." Possibly, though, the word weather had already been worn out in its previous uses as an adverb.

Without following this particular article any further, or turning to plenty of others which might as easily be cited, let us look to any current publications in which there may be found descriptions of some of the new yachts and see how they stand the test of the accepted rules of grammar even though many of them are probably written by naval architects who are in constant contact with sailormen and who would make no grammatical errors in other subjects.

In almost any of these there may be found the adverb "aft" used instead of the adjective "after"; so, instead of seeing the expression, "after companionway" or, "after deckhouse," etc.; there will generally be seen "aft companionway" or, "aft deckhouse."

Again "aft" will be found used to express relative position instead of the proper word "abaft" and sometimes it is improperly used to describe some position beyond the vessel where "astern" is what is meant. In its true sense "aft" means direction within or on the ship, as, for instance, the captain has gone "aft" or "lay aft to muster," etc.; but it never should be used for direction beyond the ship where the word "astern" is proper, as in saying "the dinghy was towing *stern*," or, "*astern* of us lay a full-rigged ship."

Another adverb of direction is similarly formed by the prefix "a" in the case of "abeam" formed from the noun, or adjective, "beam." As an adjective we have "a *beam* wind, a *beam* sea or *bow* and *beam* bearings"; but as an adverb of direction we have "the buoy bears *abeam*" and, like "astern," it is employed only for direction beyond the ship.

In addition to words governed strictly by rules of grammar there are some determined only by convention, but in deepwater parlance the convention is sufficient. As an instance, there is the difference between "down" and "below" where the deck may be said to be the dividing line. From aloft you "lay down to the deck," while from the deck you "lay below," or, you refer to the "watch *below*."

In listing the above errors, mention has only been made of the ones rarely avoided by others than those of the Frank Bullen class. Even Kipling, in his description

of the Jutland fight, speaks of one of the English destroyers finding that "she made no water *aft* of the damage." If one were to attempt to take up the errors occasionally made the task would be too considerable, but in addition to the above faults of grammar there is remembered a constantly recurring one in the descriptions of a number of the America's Cup races in one of New York's most prominent dailies by one who signed his articles with his name and the title "Yachting Expert." In these descriptions, whenever he wanted to state that one of the yachts changed from the port tack to the starboard tack he described it as "tacking to starboard," and changing from the starboard to the port tack he called "tacking to port."

New York. J. H. B.

Commodore Benedict a Life Member

Editor of THE RUDDER:

THE RUDDER is a most worthy and commendable magazine and I wish to be considered a continuous subscriber as long as I live and when I die you may send it to me C.O.D. I enclose herewith my check for $2 for one year's subscription.

It is thirty years last January since I bought Oneida. As stated in one of your previous issues, in an article by Captain Summers, she has taken me safely over 231,000 miles, a distance from here to the moon. I am just putting her in commission for the Summer and am just starting to be at the opening of the Seawanhaka-Corinthian Y. C. at Oyster Bay, where I am told very few yachts will appear.

Greenwich. E. C. BENEDICT.

We Stand Corrected

Editor of THE RUDDER:

I congratulate you on the articles on the building of the "chasers". They are most interesting and I want you to mail to me two extra copies.

By the way I suppose you have seen the error in the spelling of the word "meniscus" on page 408 in the article on barometers. This is a bad one, in an article that is supposed to be technically correct. I hope you will correct it in large type in your next issue.

Philadelphia. WM. M. C. KIMBER.

As you say the error was a bad one. Some would blame it to the poor typesetter who has to shoulder so much but instead we will admit the error and trust it will not happen again.—[EDITOR.]

Warm Praise from an Old Friend

Editor of THE RUDDER:

I wish to congratulate you on the very marked improvement in THE RUDDER, and I hope you will be able to continue the pace.

New York. PERCY W. MEAD.

Whistle Salutes

Editor of THE RUDDER:

Why do some yachtsmen salute passing vessels with three long blasts of the whistle instead of dipping the ensign?

Maryland. A. BLANCO.

For the same reason that some persons nod their head instead of lifting the hat when saluting a lady. The proper and courteous salute is to dip the ensign. Haul it down slowly and keep it down until answered, then slowly hoist up, both vessels at the same time.

Engine Room

Editor of THE RUDDER:

Could you inform me of any kerosene attachment for a Model L Schebler carbureter, or any kerosene burner that will perform the same function? I desire to use it on a 20-h.p. marine engine. Could you also inform me what fire test lubricating oil would be best for an engine turning over about 550 r.p.m.?

Illinois. H. D. M.

So far as we know there is no such an attachment which can be used with any carbureter. Had you mentioned the name of your engine we might have helped you more, for some four-stroke-cycle engines can be made to operate on kerosene by using a Kingston duplex carbureter, manufactured by Byrne, Kingston & Co., Kokomo, Ill. You will find it impractical to throttle the engine to any great extent without changing from kerosene to gasolene. If your engine is a two-stroke-cycle this carbureter will not do, for it is not possible to use kerosene, by means of a carbureter, in two-stroke-cycle engines. The fire test of a lubricating oil for gas engines may be as low as 500° or as high as 600°. It depends upon other characteristics, such as natural viscosity, method of manufacture, petroleum from which obtained, etc.

* * *

Editor of THE RUDDER:

Can you tell me why marine Diesel engines are not more universally used in this country? What are the principal drawbacks to their manufacture and more general use here?

New Jersey. R. J. HITCHENS.

We cannot definitely say, but the price and supply are no doubt the why. It is our belief that the principal drawback to their more general manufacture, their more reasonable selling price, and quite naturally their more general use as a result, is due to the inability of present manufacturers, for the most part, to appreciate that a more knowing selection of material for the cylinders and pistons is one essential, as well as their proper casting, heat treating, machining, and fitting. America seems to be far behind Europe in marine Diesel engine construction, even when using the same design here as abroad. Except for submarine use the semi-Diesel seems to be in greater favor abroad than the Diesel. A great many American installations of semi-Diesels have been made during the past year though practically all of foreign manufacture.

* * *

Editor of THE RUDDER:

Last Summer I changed the ignition of my four-cylinder engine from make-and-break to jump spark, installing a high-tension magneto. I had more or less trouble to start without "priming" the cylinders. This Spring I installed a single-spark battery ignition system, using another separate set of plugs, and I find it possible to get from 12 to 28 r.p.m. more than running on the magneto. I know it is not the result of plug location, for when I use the plugs in the center of the heads for

the magneto ignition and the plugs over the inlet valves for the battery system, the difference is about .12, while with the battery system connected at the center plugs I get 28 more revolutions. This seems to me to show that plug location and the battery system account about 50—50 for the increase in engine speed. Can you explain?

New Hampshire. A. E. H. BROWN.

It looks very much as if the actual timing of the break in your magneto breaker box was not at absolutely 180°. We presume your engine to be a four-cylinder, the magneto armature producing two sparks or breaks at each revolution, or two revolutions producing the four sparks. The only way we could account for this would be that the breaks of the spark producing circuit in the battery system were more nearly correct than in the magneto make-and-break mechanism.

* * *

Editor of THE RUDDER:

Is it possible in a twin-screw boat, propelled by air-starting and reversing engines, such as the 80-footers described in June RUDDER, to run with one engine and not have the propeller of the idle engine hold back?

Maryland. ARMSTRONG EVANS.

Apparently no means is provided to disconnect the propeller shaft from the engine crank shaft, although cut-off couplings probably could be installed which would make it possible. * * *

Editor of THE RUDDER:

Will you please tell me what so-called "casing-head" gasolene is, how it is produced and for what ordinarily used?

Staten Island. O. P. TIMMONS.

What today is commercially called "casing-head" gasolene, is really liquid natural gas, or rather natural gas reduced to liquid form by means of compression. It is used as a solvent, but for the most part in fortifying heavy gasolene, raising its specific gravity. There is little doubt that the use of casing-head gasolene for this latter purpose, especially where low grade or the lighter gravity kerosenes are used in thus producing a fuel called gasolene, may cause a cold engine to start more easily, but such an advantage, it seems to us, is more than offset by the disadvantage as a result of interfering with the proper lubrication of the pistons, rings and cylinder walls. It is a well-recognized fact that kerosene will "cut" the lubricating oil, and wash it into the crank case of a gas engine. * * *

Editor of THE RUDDER:

I have a multi-cylinder, heavy-duty four-cycle marine engine, which I have used for several seasons. Would a heavier bodied oil be preferable to the oil I used when the engine was new? I find that the engine starts harder than it did and that my eyes smart from the acrid smoke fumes which seem to come from the engine base. What causes this and how can I overcome or remedy this undesirable condition?

Ohio. RONALD ROWLY RICH.

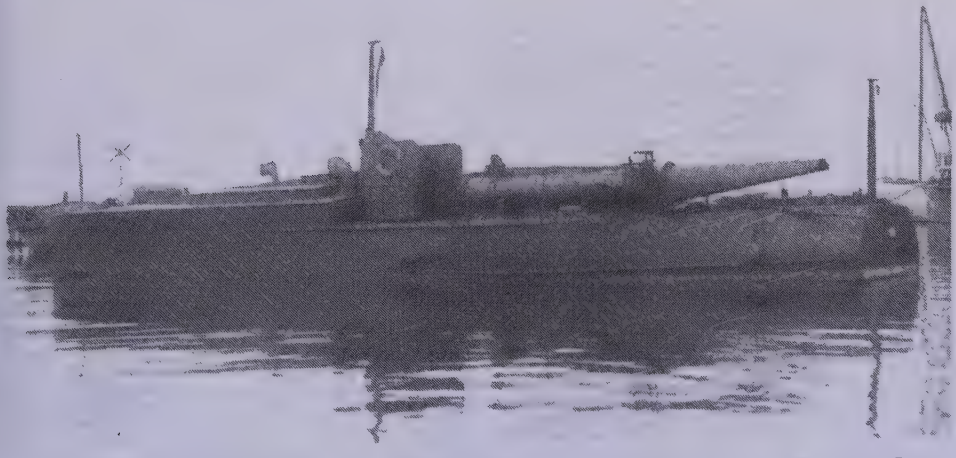
After even two or three seasons the oil used should be slightly thicker. It looks as if your pistons, rings or cylinders were defective or that the oil is too thin to act as a "pack" to prevent leak of the burned gases past the rings. If a heavier oil does not help, you may have to overhaul the engine in order to locate the exact cause of the trouble. * * *

Editor of THE RUDDER:

Would two engines of the same bore, stroke and speed drive a boat faster or slower than a single engine of the same developed horsepower at the same speed? If not, why not?

New York. ARTHUR J. GRAVES.

The larger engine could have a more efficient propeller than the two smaller engines because it could have a larger diameter, and the water against which the larger propeller would exert driving force would probably be less disturbed, or fairer.



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THE RUDDER

[Title Registered U. S. Pat. Office]
Published on the Twenty-Fourth of the Month
BY
THE RUDDER PUBLISHING COMPANY
254 West 34th Street, New York, U. S. A.
To whom all communications should be addressed
Down Town Sales Office
9 MURRAY ST., NEW YORK
Arthur F. Aldridge, President
Andrew Paterson, Vice-President and Business Manager
James R. Thomson, Treasurer
Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

War Yachts versus Peace Yachts

The conscription of privately-owned pleasure vessels to bolster up a weak navy in time of war is so firmly established as the custom of all governments that it is accepted as a matter of course; no thought being given to the results of such a policy nor to the desirability of a change when conditions permit. The origin of the custom, in the days when sail was the supreme power, when the larger yachts with their crews in tarpaulins and pigtails and guns on their decks were but a step removed from privateers, and the superior speed of the smaller made them valuable as despatch-boats, is easily discernible; but such conditions no longer exist.

To go directly to the root of the matter, the naval programs of all nations extend no further than the provision for fighting vessels of large tonnage; battleships, armored cruisers, destroyers, torpedo-boats and submarines, with their immediate auxiliaries such as colliers and hospital ships. The experience of a century of sea-fighting proves that, however strong in these prime elements a navy may be, it is, nevertheless, inefficient and incomplete without the secondary division popularly known as a "mosquito fleet," made up of a very large number of small units suited for a variety of uses. There must be mine-layers and mine-sweepers, guard-boats for the mine field, harbor patrol boats, coast patrol boats, and larger craft for the offshore patrol. Small craft in large numbers are needed for Red Cross and other hospital work, and the increasing complexity of the entire naval machine, especially since the perfection of the airship and the submarine, has opened new fields for the employment of vessels of under 100 tons.

In these days of specialization, when every tool is designed to perform some one particular purpose rather than as an all-around combination, it seems absurd that no timely provision is made for the smaller naval auxiliaries, and that when the emergency arises there is no possible course but to commandeer the yacht fleet. If the question were asked of the reason for such a condition, the reply would be given without hesitation that all the money available in times of peace was needed for the great fighting units with their armor, guns and ammunition; but while only too true as far as it goes, this does not dispose of the fact that such a lack of system gives the poorest possible results at the maximum cost.

The yacht, both small and large, is at best an expensive luxury; a part of the cost goes into such a lightening of the construction as actually unfits the hull for other than yachting service; a much larger proportion, at least 25%, goes into finish and fittings, bronze, teak and mahogany, which are unnecessary in a working vessel, and into decorations and furnishings which are worse than superfluous. In the conversion of a yacht to any one of the many services of war the first step is the destruction of hangings, furniture, bulkheads, etc., ruthlessly ripped out and thrown on the dock; the next, immediately or after it has been found necessary by trial, is the strengthning of the hull as a whole; and, in addition, local strengthening will be necessary for the guns and, perhaps, as in the Spanish War, for the protection of the more vital parts by a light steel plating. After the necessary provision is made for stores and ammunition, it is a serious question as to what will be left of those essentials, displacement, buoyancy, speed and steering qualities, on which the vessel must rely for a successful performance. It is safe to say that in most cases the result is an inefficient and unsatisfactory makeshift at a cost of at least double that of a properly designed patrol boat.

By no means the least of the evils of the system lies in the method by which the yacht fleet is taken over by the Government. Experience proves that it is impossible to steer a fair and wise course between two extremes; either the yachts are purchased by the Government at figures far above their value, or they are practically commandeered without regard to the rights or wishes of their owners. It is a matter of history that the former extreme was reached in the Spanish War, and it seems likely that the opposite will be realized in the present case.

In spite of some severe official strictures on American yachtsmen, it does not appear thus far as a class they have been other than generous and patriotic. Many owners have offered their yachts either as gifts or to be loaned indefinitely without compensation, a number of leading yachtsmen have placed orders for specially designed patrol boats of large size to be given to the Government, and many men not generally known as yachtsmen have purchased yachts for the same purpose.

When it comes to the other side of the case, the proceedings are, if reports be true, more summary and expeditious than just. The yacht is appraised by the Government at cost and an allowance is made for depreciation; the owner being given the difference. The first cost to the owner may represent but a fraction of his ultimate outlay before the vessel is suited to his requirements to say nothing of the cost of replacing her today and it is quite possible that he has a sentimental interest in her which makes him reluctant to sell even at a good price, but he has no option in the matter.

Of the many considerations involved there is one of vital importance. That the nation has today a large fleet of yachts to fall back on in an emergency (to say nothing of the great body of experienced yachtsmen which has already volunteered), is due solely to the prosperous condition of American yachting through private effort and absolutely without Government aid. While it has proved necessary for yachtsmen to combine, and at times to fight earnestly against hostile legislation, it would be a difficult matter to find any laws favoring

or encouraging yachting. The sport throughout the length and breadth of the country owes nothing to national legislation, and what it now gives is from pure and unadulterated patriotism and public spirit. There is nothing from either a technical or an economic standpoint to justify the past and present policy of depending upon the private interests of a sport for work that obviously belongs to Congress and the Navy Department; and it is not too much to hope that when peace shall finally come, it will bring a more liberal and fostering policy toward yachting and such a comprehensive and progressive scheme of naval development as will forever eliminate all consideration of the yacht as a naval auxiliary.

Slow Work With 110-Footers

"Somewhere at Sea" is a phrase now used to indefinitely state where warships are operating. It seems to be appropriately applied to the Navy Department and to the Shipping Board. Of course the Naval vessels and the ships are expected to be at sea, but why there should not be more efficiency in the executive department and in the newly organized Shipping Board is past understanding.

First the Department muddled the building of the 110-foot patrol boats. In all orders have been placed for three hundred and thirty-five, of which one hundred and thirty-five are to be built in Navy yards and two hundred by private builders. The Department has issued a statement telling that the building of the boats is progressing well and that several are now nearing completion. It was expected that those to be built in Navy yards would be completed, because those yards are well equipped for such work and the Government is able to procure all the necessary materials at moderate cost. In the private yards, however, all is not well, at least in some of them. A few of the larger builders have made good progress but the smaller ones, and particularly those "mushroom" concerns that were organized overnight, are having trouble. One reputable builder, who has only a few boats to build, has been waiting for weeks to get ordinary keel bolts delivered, and he must wait until the manufacturers are ready. Some others that carried their offices in their hats are still trying to secure some yard where they can start work. Had the Department followed the advice of the boatbuilders a fleet of probably one thousand boats could have been turned out by the end of the year and at a saving of at least 25% on the prices now being paid.

Ship-Building Booming

The shipbuilding industries in this country have boomed beyond the wildest dreams of anyone connected with it. Every shipyard has all the work it can do for years to come. New companies are constantly being organized, and plants erected where steel and wooden vessels are to be built. The U. S. Government is financing a big scheme and Congress has appropriated $750,000,000 to pay for new ships. The United States Shipping Board has planned for the building of one thousand wooden vessels of 3,000 tons each, and then Major-General Goethals was placed at the head of the U. S. Shipping Board Emergency Fleet Corporation to carry out the plans of the Shipping Board. Unfortunately General Goethals disagreed with William Denman, who is the head of the Board, and consequently for weeks things have been dragging. General Goethals is an engineer and used to doing big things. He decided that it would be impossible to build so many wooden vessels and at once started in to revolutionize ship-building by going to steel instead of wood and adopting standard methods of fabrication. He has the hearty support of all the big steel men in the country and if left to carry out his plans will succeed, just as he did when he built the Panama Canal. Mr. Denman, however, has held up contracts for steel work and is trying to force the building of the wooden ships. His mind runs to wood naturally, because when he was a lawyer in San Francisco among his clients were wooden shipbuilders and lumber firms. Wooden vessels will be built. Many builders have already started work on these vessels. All the ships that can be built are needed in the present crisis, and if General Goethals is allowed to proceed with his plans in eighteen months the United States will own the largest fleet of cargo-carriers in the world.

National Nautical Schools

While the Shipping Board was planning to build a fleet of cargo-carriers and send them across the ocean loaded with provisions and supplies, it took the brains of a yachtsman to find out that these ships, without competent officers and seamen, would be of no use. Just as it is impossible to navigate without sextants and chronometers, of which there is a dearth, so it is impossible to send ships to sea without competent men to handle them. Mr. Henry Howard, a very active member of the Eastern and other yacht clubs, realized while others were talking of ships that ships without navigators would be useless. He planned at once to establish Nautical Schools at different points along the coast, where men will be taught the elements of navigation, and later these men are to get some practical experience at sea, serving as junior officers on coastwise vessels or vessels in the South American trade. Mr. Howard explained his plans to the Shipping Board and has been appointed Director of Recruiting. The teaching staff of the Nautical Schools will be under the direction of Dean Alfred E. Burton, of the Massachusetts Institute of Technology. Ten thousand officers are needed for the fleet of vessels now building.

* * *

There has been some yacht racing this year and there will be more. The Gravesend Bay Association has arranged for races every Saturday afternoon during the Summer. On the Sound the Larchmont and other clubs will hold races during July and August. The Philadelphia yachtsmen are taking part in races and some of the big power-boat events will be run off according to schedule. This is as it should be. There is no reason why all sport should be stopped because we are at war, and yachting particularly should be carried on, because it enables many to learn how to handle boats, to navigate and to later on become experts with the patrol boats.

Spokes from the Rudder Wheel

The annual race of the New York M. B. C. to Albany and return is scheduled for Saturday, June 30th. The entry list is a large one and the race promises to be the best in many seasons.

* * *

Yacht races have been sailed by the Seawanhaka-Corinthian and the Bayside Y. Cs'. one-design classes on Saturday afternoons, but so far there have been no open regattas. As the date assigned for a race comes around the club scheduled for that day announces its cancellation. It is expected, though, that there will be considerable racing during July and August of small boats, and the Larchmont Y. C. intends to hold its annual regatta on July 4th and its race week later in the month.

* * *

The Jamaica Bay M. B. C. will hold a power-boat race to Poughkeepsie and return, 166 miles, starting on August 25th. A time limit of 36 hours has been fixed. There will be no race around Long Island this Summer. Other events scheduled by the Jamaica Bay Association are: July 7th, Belle Harbor Y. C.; July 15th, Jamaica Bay Y. C.; July 29th, Motor B. C. of Jamaica Bay; August 5th, Rockaway Point Y. C.; August 12th, Bergen Beach Y. C.

* * *

The dates tentatively set for the Gold Cup races are August 23d-27th at Minneapolis. The Racing Commission of the A. P. B. A. has announced the committees to manage the Gold Cup races and the mile trials as follows:

Committee of Judges: George C. Krusen, Philadelphia, representing the A. P. B. A.; J. Francis Schefeik, Minneapolis, representing Miss Minneapolis B. A.; Charles M. Englis, Brooklyn, representing the Lake George Club.

Race committee: George C. Krusen, J. Francis Schefeik, Charles M. Englis; Harry Sampson, timer; Frederick K. Lord, measurer; Captain George W. Freeman, surveyor of the course.

* * *

Henry R. Rea, of Pittsburgh, has donated his yacht Monaloa to the Fourth Naval District for Patrol Service. The Monaloa is 137 feet 4 inches long over all, 108 feet 6 inches on the water-line, 15 feet 9 inches breadth and 7 feet draught. She is a flush deck vessel and is driven by two six-cylinder Speedway engines of 300 h.p. each. She was built by Lawley for Chauncey B. Borland, of Chicago, and was purchased recently by Mr. Rea, through Cox & Stevens. Henry Oliver Rea, son of the donor, and several of his friends have enrolled in the Naval Coast Defense Reserve and will serve on the Monaloa.

* * *

The steam yacht Lyndonia has been sold by W. A. Lyndon, of Chicago, to the Navy Department through the International Mercantile Marine Company. This yacht was built from designs by William Gardner in 1911 and is a steel vessel 214 feet length over all, 172 feet water-line, 26 feet 6 inches breadth, 12 feet 3 inches draught. She was built by the Pusey & Jones Company at Wilmington.

An error in last month's issue of THE RUDDER made L. P. Percival as the owner of the launch Manatee, which has been taken over by the Government. The Manatee was built for Mr. Percival, but was purchased last Fall by Commodore J. B. Fallon and turned over to the Government by him.

* * *

Frederick W. Bickmann, of the firm of Strong & Bickmann, yacht brokers, has for the time retired from the yachting business, having accepted a position as chief clerk in the office of the United States Shipping Board Emergency Fleet Corporation, which is in charge of Eads Johnson, at 115 Broadway.

* * *

The war has created a great demand for naval architects and for a time Bowes & Mower, of Philadelphia, have suspended their regular business, each having accepted positions with the Government and they will now expedite matters for National Defense.

* * *

There will be some yacht racing on Gravesend Bay this Summer. No attempt will be made to sail championship races, but as there are several small craft in commission the regatta committees of the clubs in the association have arranged a schedule, which is as follows: June 23d, New York C. C.; June 30th, Gravesend Bay Y. C.; July 4th, Bensonhurst Y. C.; July 7th, Crescent A. C.; July 14th, Atlantic Y. C.; July 21st, Era Y. C.; July 28th, Bensonhurst Y. C.; August 4th, New York Canoe Club; August 11th, Crescent A. C.; August 18th, Atlantic Y. C.; August 25th, Gravesend Bay Y. C. The usual prizes will be suspended, but some souvenir of the races will be presented to the winners.

* * *

The American Model Y. C., whose clubhouse is at the foot of 60th Street, Brooklyn, has scheduled races for June 24th, July 4th, 15th, and 29th, August 12th and 26th, and September 3d.

* * *

Clarice is the name of the new Class R sloop built for Commodore Alexander Winton, from designs by Gielow & Orr. The older Winton boat is now named Spook II. Clarice sailed her first race on Decoration Day. The wind was fluky and the fleet of six boats divided in two divisions. Clarice stuck to Pam, last year's champion, and beat that boat four minutes, although she did not win the race. The second race was sailed in fog and rain. Clarice had a good lead at the weather mark but later the contest became a fizzle, because none of the boats could find the second mark.

* * *

Sari, a Class R sloop, built for Samuel Daucy from designs by John G. Alden, has arrived at Chicago and will tune up there for the series of races for the Lipton Cup.

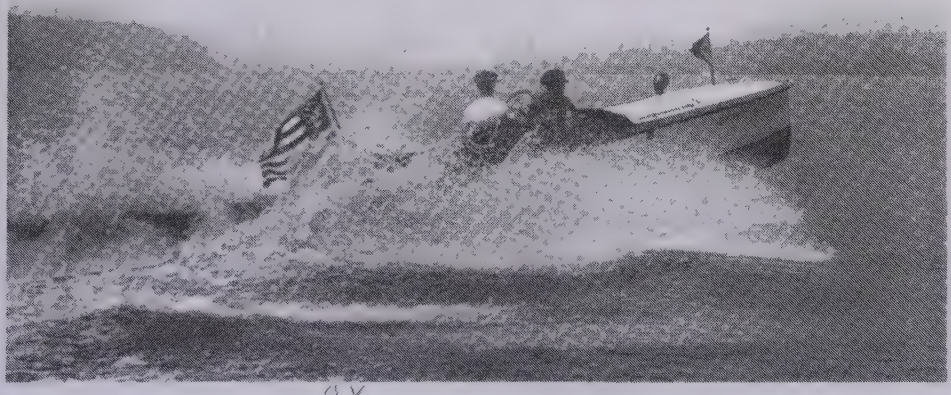
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Commodore Wilson Marshall has lent his steam yacht Ansantawee to the Yale Naval Training Unit. The yacht is in charge of Professor Abbott and is manned entirely by Yale undergraduates, of whom Commodore Marshall's son is one.

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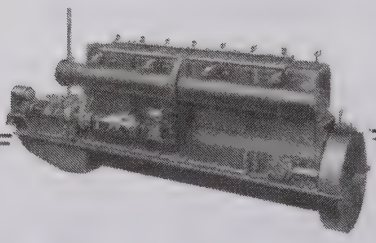
THE RUDDER

AUGUST
1917



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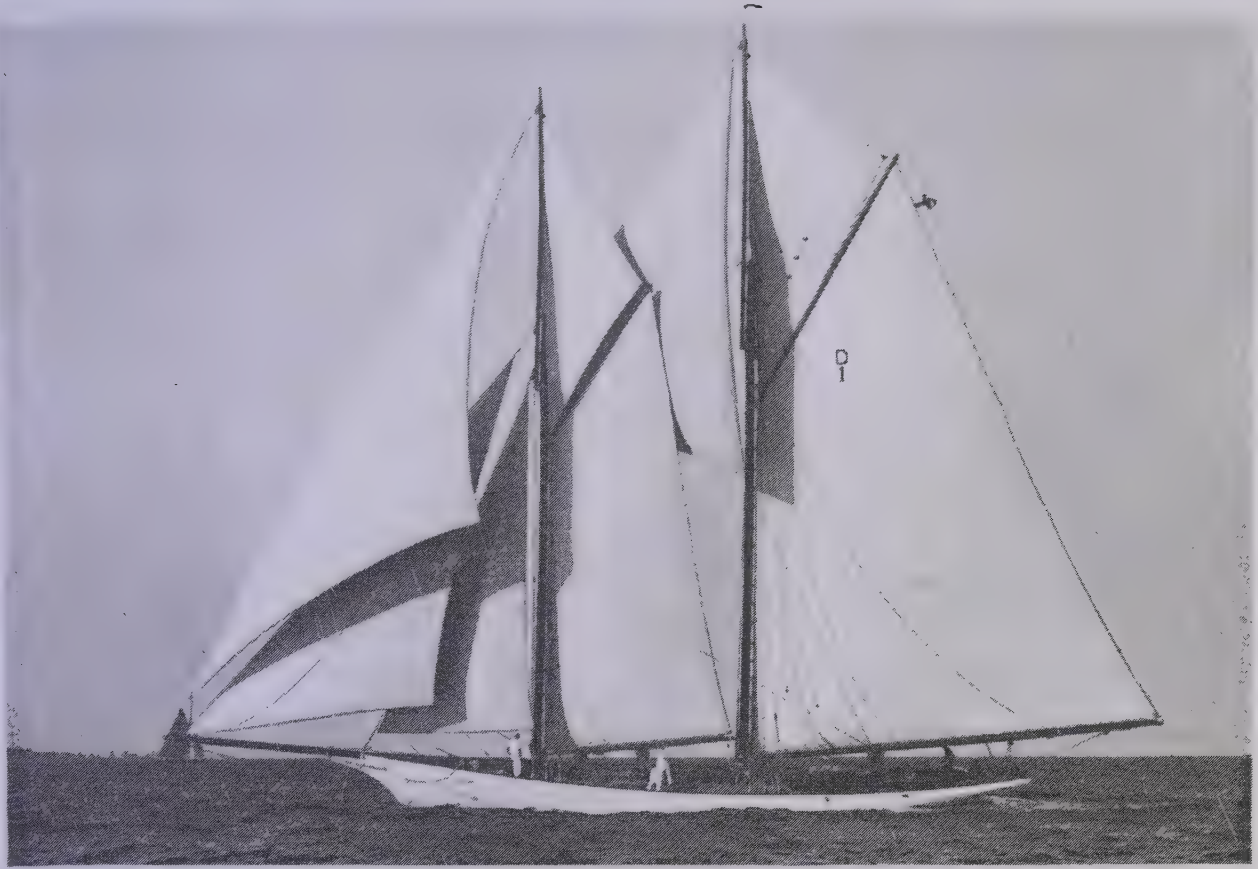
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A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | August, 1917 | No. 8

Yachting is Getting Lively

NATURALLY the war upset all the plans made by yachtsmen and yacht clubs. Until the Government at Washington severed diplomatic relations with Berlin, last February, the outlook for a fine season was exceedingly bright. Many new fast power boats had been built during the Winter and many races had been arranged in which these boats would have competed. The rules too were changed slightly in order that fast and slow boats might meet on more even terms. Among the sailing yachtsmen many fine races were anticipated. The schooners Elena, now the property of Commodore Cornelius Vanderbilt, and the Queen, owned by Commodore E. Walter Clark, of Philadelphia, as well as other fast schooners were to have been in commission. The 50-footers of the New York Y. C., the 40-footers built last year were to have resumed their battles, and a new class of 40-footers built for members of the Larchmont Y. C. were to have added to the interest. Then the Manhasset Bay Challenge Cup and other trophies were to have been competed for, so that yachtsmen would have been hard pressed to find time for all the events planned.

The war came and all the important events and the schedules were cancelled. There were many yachtsmen, however, who favored some activity in yachting. They argued that it was foolish for everyone to stop all recreation because of the war. It was pointed out too that yachting had developed many men who have been able to help in the defense of the country by manning the patrol fleet. Without the yachtsmen it would have been difficult to have commissioned that fleet of small boats, and the yachtsmen's sport has developed a line of defense here just as it did in England. It is very probable that more men will be wanted to man other boats before the war is ended, and by sailing yachts and handling power boats, either cruising or racing, would have helped to develop the men needed.

President Wilson has given yachting, all sports, in fact, a big boost. He has urged that sportsmen take part in their favorite pastimes, especially during the summer months. There is nothing that will build up or give health like out-of-doors exercise. Now yachtsmen who had not contemplated having their



Starting Off on the Long Trip to Albany and Back From Off the New York Motor Boat Club House



Sonder Class Yacht Feather, Owned by Allen Clarke

yachts in commission have ordered them to be fitted, and the coming two months will see a great improvement in yachting in all waters where this sport is patronized.

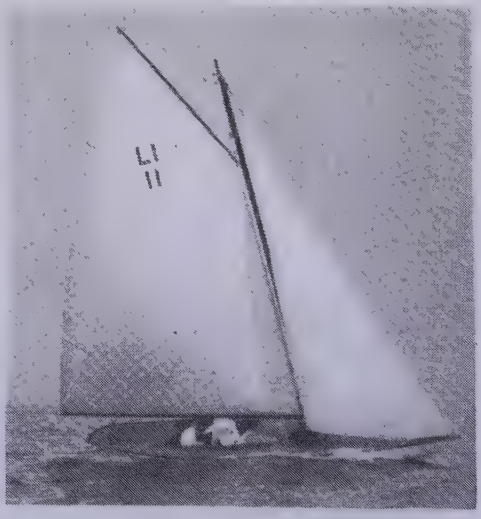
But all yachting has not been stopped. The hysteria which at the commencement of the war caused the people of this country to do many things unwisely, is disappearing and in the yachting world there has been quite a boom in the past few weeks. The small yachts are in commission. Hundreds of them have been overhauled and are being used by their owners. The racing fever has developed among these owners and there is now much racing with small craft, both power and sail. An idea of the number of cruising power boats that are in commission may be had from the action of the Navy Department in requiring that all vessels engaged in the navigation of defensive sea areas be licensed. In each Naval District orders have been issued that owners must obtain a license from the Commandant of the district in which they belong. In the Third District, New York, so many applications were made that it was necessary to secure the services of several more clerks to receive the applications.

The New York Motor Boat Club had a very successful race to Albany and return, in which eight boats took part. Other races are to be held during the Summer. In Southern New Jersey waters, on the Delaware River and at Barnegat, the racing is as popular as it was last year and apparently there are just as many boats taking part in the sport. On Jamaica Bay, Gravesend Bay and on Long Island Sound the owners of small craft are very active and in many classes the sport has been very keen. In other sections too there is much interest in the sport. THE RUDDER will publish all the yachting news that can be gathered. Naturally, if there is no yachting there can be nothing to publish, but in the past few weeks interest in the sport has taken such a boom that this month there are many events to report that will be of general interest.

On Gravesend Bay several small yachts have been racing consistently every Saturday afternoon. When the regular schedule was abandoned, the chairmen of the regatta committees of the clubs enrolled in the Gravesend Bay Association arranged to hold races for such boats in commission whose owners wished for some sport. No regular classification was adopted but it was agreed that some race would be arranged for any owner who came to the starting line. The handicap classes filled and some of the smaller craft, such as the Gravesend Bay dories, locally known as the Q Class, and some Stars have furnished interesting contests. The schedule arranged ends with this month, but if the owners want more races it will be extended to the end of the usual season. The schedule for this month is: August 4th, New York Canoe Club; August 11th, Brooklyn Y. C.; August 18th, Atlantic Y. C.; August 25th, Gravesend Bay Y. C. Originally August 11th was for the Crescent A. C. That club managed a race on July 7th and at the request of the Brooklyn Y. C., which did not have a date in the original schedule, relinquished its claim to a regatta.

On the Sound several clubs have held races in home waters, but the New Rochelle Y. C. sailed an open regatta on June 30th which attracted a large entry, and the regatta was a very successful one. The success of this regatta so pleased the owners that it was arranged that other open events should be sailed during the remainder of the season, particularly for the handicap classes and for some of the smaller craft. These races will be managed by the Handicap Association and the first was sailed on the Sound off New Rochelle on July 14th.

There will be no open regattas under the auspices of the Indian Harbor Y. C. this Summer, but the members



B'Bar, L. Valentine, Owner, One of the Larchmont Interclub Class at New Rochelle Y. C. Regatta

of the club are sailing club races on Saturdays and Sundays just as they did in former years. By order of Commodore William H. Childs the following notice was sent to the members by Richard A. Monks, chairman of the regatta committee:

"Pursuant to the policy of this club, all of its available resources will be used for the relief of sufferers from the war conditions. It has, therefore, been decided to hold no open regattas this year and the money usually donated for prizes and regatta funds will be turned over to the Red Cross or some other relief organization which, in the opinion of the officers, will be most efficient in its distribution."

The contestants in the weekly races race for pennants instead of more valuable prizes. A pennant goes to the winner of each race, and the yacht scoring the most points in the series for the season will receive a pennant when all the races are ended. The Arrow Class are furnishing the best sport, six yachts taking part in the series. These are Rear-Commodore Leonard H. Dyer's Jack o' Lantern, which is sailed by Abbott Brush, as Commodore Dyer is now in charge of the Bridgeport section of the Third Naval District; R. L. Slavin's Hawk, Commodore W. H. Childs's Pep, Vice-Commodore Clifford D. Mallory's Rani, Addison G. Hanan's Comrade and J. D. Chapman's Snapper.

At Oyster Bay the yachts of the Fish Class, owned by members of the Seawanhaka-Corinthian Y. C., sail every Saturday afternoon and on holidays. Among the racers have been J. P. Morgan's Shark, W. H. Appleton's Pompano, De Forrest Fish's Barracuda, Dr. L. S. Bishop's Sabalo, Commodore Howard C. Smith's Blue Fish and A. Strauss's Manatee.

Manhasset Bay is filled with small craft, power and sail, and the harbor appears to be almost as crowded as it was last year, when yachting was very active everywhere. The three clubs with houses on this harbor are the Manhasset Bay Y. C., the Port Washington Y. C. and the Knickerbocker Y. C., and as this harbor may be termed the home of the Star Class, of course the Stars furnish the best of the sport. There are races for the boats of this class every Saturday and Sunday afternoons and the interest is always keen. Among the boats competing are Charles E. Hyde's Hydra, G. W. Elder, Jr.'s Vete, George A. Corry's Little Dipper, Allan Walker's Little Bear, N. Edgerton's Banshee II, E. V. Willis's Altair, E. A. D. Percival's Mars, J. A. Maher's Flake, and Alder and O'Brien's Canis Minor.

Perhaps the most lively port on the Sound is Bayside. The Bayside yachtsmen are always most enthusiastic and the fleet of small craft is as usual competing regularly. The Birds and Bees originated at Bayside and the races in these two classes are very keen. In the Bird Class such boats as Donald Cowl's Heron, W. R. Teller's Woof, C. L. Willard's Curlew and John Johns's Teaser are racing for points. In the Bee Class are G. T. Hopewell's Maybe, James Gillies's Vespa, H. T. Rust's Rebe, J. Clarke's Befirst and J. Dailey's Bewon. Then to round out the sport several Stars are being sailed regularly and before the Summer is over it is very probable that an interclub regatta will be arranged with the Port Washington boats, which will be an event well worth witnessing. Among the Stars at Bayside are H. F. L. Funke's Southern Cross, George Abbott's Aria, John Nesbett's Starlight, W. L. Inslee's Shadow and K. Grombie's Shooting Star.



Handicap Yachts in Close Company in New Rochelle Y. C. Regatta



Mrs. W. L. Inslee Sailing Shadow in the Race for the Stars

Bayside's Fair Sailors

The Bayside Y. C., although a comparatively new organization, sets the pace for many larger and older clubs. This year is no exception to the rule, and while many of its members are now actively participating in the war those members who are at home are yachting and so keep up their spirits, help to keep things booming and develop seamanship among the younger generation, so that they too later may be able to help in national affairs.

The Bayside Y. C. long ago encouraged women to learn the art of sailing. Each year it holds a special regatta for women sailors, just as some other clubs, notably the Seawanhaka-Corinthian and the Atlantic, do. This year this race was sailed on June 30th over the usual courses on Little Neck Bay. The contestants were favored with good weather. Eleven yachts, divided in three classes, started and the course was 4½ miles long. In the race for the Birds, Miss Lucy Willard, daughter of C. L. Willard, who has raced one of the Bird yachts since the class was organized, as usual had charge of her father's yacht Curlew, and she won the race. Miss Katherine Adikes sailed the Teaser and finished second, beaten 1 minute 53 seconds, and Woof, sailed by Miss Florence Teller, was third. Miss Teller is the daughter of Vice-Commodore Teller and she, like Miss Willard, has been prominent in racing for some years. These young ladies do not confine their efforts to their home club but have won races in other waters.

In the Star Class there were five starters. Mrs. W. L. Inslee won the race in the Shadow after a most exciting finish with the Starlight sailed by Mrs. A. Nesbett, and at the finishing line Shadow led by 3 seconds. Aria, sailed by Mrs. George Abbott, was third, Southern Cross, sailed by Miss Inslee, and Big Dipper, sailed by Miss Helen Johnson, followed in the order named.

Mrs. Inslee is the wife of W. L. Inslee, who has raced on Gravesend Bay for several years. He recently moved to Bayside and joined the Bayside Y. C. so that Mrs. Inslee has strengthened the ranks of the women sailors in this club, and Miss Marie Inslee, a sister of



Miss Florence Teller Carefully Overhauling the Running Gear of Woof



Miss Marie Inslee Ready to Sail the Southern Cross

W. L. Inslee, who is a clever helmswoman, is also in the Bayside ranks. Miss Helen Johnson, who sailed Big Dipper, is a novice. This was her first race, but she showed that with a little more experience she will be able to hold her own in the best company.

In the Bee Class Bewon, sailed by Miss C. Williams, was the winner; Maybe, sailed by Miss Helen Clucker, who has been successful in many races, was second, and Vespa, sailed by Mrs. James Gillies, was third.

The Bayside Y. C. has been fortunate in developing sailing among women, and in addition to those who took part in this regatta, there are Mrs. Herbert F. L. Funke, who has been a winner in almost every previous women's regatta and Mrs. W. H. MacGregor, who has proven her skill in fair and foul weather many times. While this club holds only one race each season for women it is no uncommon thing to see women sailing small yachts on the bay at all times. It is so frequent an occurrence that it causes no comment.

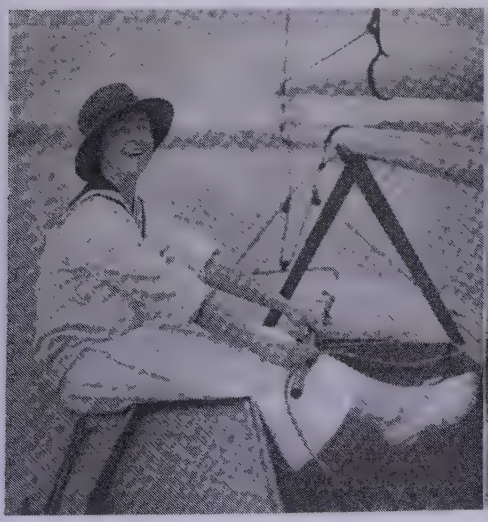
On July 14th in the usual weekly regatta the sons of members handled many of the racers particularly in the Bird Class. Clifton Willard, fourteen years old, sailed the Curlew and won, John Johns, son of Commodore W. H. Johns, sailed the Teaser, and W. R. Teller, 15-year-old son of the owner, sailed the Woof. The Bayside Club has arranged to sail races on every possible occasion throughout the season.



Miss Helen Clucker Busy Overhauling the Maybe

Detroit River Racing

There has already been considerable racing on the Lakes under the auspices of the Detroit River Yachting Association. In June and early in July several races for power boats and for small sailing craft were held and beginning July 12th the sport was almost continuous. On July 12th, 13th and 14th, the Toledo Y. C. held races for the Taft Cup. On July 15th the yachts of the Detroit River Association took part in a long-distance race from Bob-Lo to Put-in-Bay, and the week of racing at Put-in-Bay under the auspices of the Inter-Lake Yachting Association, lasted from July 16th to 21st, too late for this edition of THE RUDDER. The Detroit River Association made its annual excursion to Put-in-Bay on Thursday, July 19th, and as usual the members enjoyed themselves very much. The schedule of races



Miss Helen Johnson, Who Sailed the Star, Big Dipper



Miss Lucy Willard, Who Sailed Curlew to Victory

for August and September of the Detroit River Yachting Association is: August 4th, Detroit Y. C., mid-summer regatta; August 11th, Delrey M. B. C., power-boat regatta; August 18th, Detroit Y. C., interclub catboat races; September 1st, Delrey M. B. C., power-boat regatta; September 1st, 3d, Country Club regattas; September 8th, Detroit Y. C., sweepstakes; September 15th, Edison B. C., interclub catboat regatta.

Gold Challenge Cup

The races for the Gold Challenge Cup are to be held at Minneapolis, August 3d to 27th. The course has not been definitely settled. It may be on Lake Minnetonka or on the Mississippi River, but the races will be held and the Cup defended against the challenges of Albert L. Judson with the Hawkeye, representing the Lake George Regatta Association, and Peter Pan VIII, owned by James Simpson and representing the Columbia Y. C.

The Peter Pan VIII is a new boat, 20 feet long, and driven by one Sterling engine of 250 h.p. The Hawkeye last year won the Thousand Islands Cup and is equipped with one Van Blerck engine. After the series for the Gold Challenge Cup the boats will be sent over the measured mile course for the one-mile championship of North America.

Miss Detroit II, built by the L. C. Smith Boat & Engine Company at Algonac, was launched on June 17th, and with this new boat Detroit enthusiasts hope to take the Gold Cup back to Detroit. In model this new boat is very similar to Miss Minneapolis but, according to Chris Smith, will be much faster. Garfield Wood, President of the Wood Hydraulic Hoist & Body Company, is the owner of Miss Detroit II, and he will steer his boat in the Cup races. Jay Smith will be the mechanician. At the launching were Commodore Gunnison, Commodore George Marsh, Commodore Alex. I. McCloud, and other power-boat yachtsmen.

Miss Miami, owned by Glen H. Curtiss; Miss Peoria, a boat that showed well in the Peoria races on the Fourth; La-Tah-He, a Hacker-designed boat which is to make more than 50 miles an hour, and "the mystery boat of St. George" are among other contestants for the Gold Cup this year. The regatta committee knows little about the "mystery boat" or its owner. The boat is being built secretly and is said to be nearly completed, but those interested at present like the idea of it being a mystery.

Arthur L. Gibson, of Red Wing, Admiral of the Mississippi Valley P. B. A., has been placed in charge of the course patrol during the races, and he will see that the course is kept clear on his own yacht Thoroughbred. The course will be below the Washington Avenue Bridge in Minneapolis, and with such a fleet of fast boats entered the series should be the best in the history of this famous trophy.

The Fourth at Peoria

The Peoria Y. C., the Illinois Valley Yacht & Canoe Club, and the Caterpillar Rowing Club managed a most successful power-boat regatta at Peoria, Ill., on July 4th. It was really the sixth annual regatta of the Peoria Y. C. and the other two clubs helped to make the event a memorable one. More than 10,000 persons lined the river-front to watch the races. Miss Peoria, a 20-foot Smith one-step hydroplane, made her first appearance. She was put in the water early in the morning and is owned by Rollen Travis, Tom Webb and a small syndicate of Peorians, who will send her after the Gold Challenge Cup. Miss Peoria covered the mile course down stream in 1 minute 5 4/5 seconds. The results of the races were:

Race No. 1—For Boats 8 Miles and Under.—Course 2½ miles; won by Irene, Elmer Hills; Edna B., Scott Bricker, second; Motor Girl, John F. Delancey, third; Trio, J. A. Durfee, fourth; Nydia, T. G. Thompson, fifth; Normarie, Rigens & Stuller, sixth; Lady Belle, W. Eckhardt, seventh; time 15:19.

Race No. 2—For Boats 15 Miles and Under.—Course 5 miles; won by Lambkin, L. W. Mecke; The Uplander, M. J. Dorsey, second; Bonnie Jean, George G. Watson, third; Baby Bell, W. L. Hallstein, fourth; time 21:28.

Race No. 3—For Boats 30 Miles and Under.—Course 7½ miles; won by Margaret, L. E. Selby; Meteor, Walter B. Wilde, second; Geraldine, Joseph Mauchard, third; time 13:58.

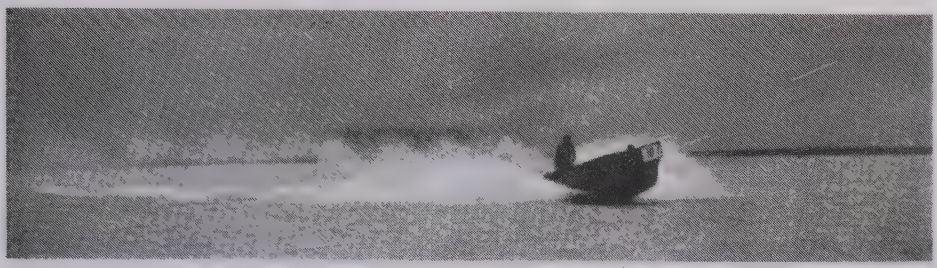
Event Race No. 4—Handicap.—2½ miles; won by the Uplander, M. J. Dorsey; Meteor, W. B. Wirde, second; Geraldine, Joseph Mauchard, third; time 10:54.

The Thousand Islands Cup

The Thousand Islands Challenge Cup will be raced for over the usual course on the St. Lawrence River on August 8th, 9th and 10th. This cup, which is emblematic of the championship of the St. Lawrence, might



The Leaders in the Albany Race in Close Company as They Pass Up the Hudson River



A Modern Hydroplane in Full Flight

this year almost be called the preliminary to the Gold Cup series of races, because several of the Gold Cup racers are to compete for the Thousand Islands Cup. This prize was won last year by Commodore A. L. Judson's Hawkeye and that boat will be a contestant this year. James Simpson will send his new boat Peter Pan VIII, and the others to race will be Wood Brothers' Miss Detroit II and Glen H. Curtiss's Miss Miami.

The Inter-Lake Race Week

The annual week of racing of the Inter-Lake Yachting Association at Put-in-Bay began on Monday, July 16th. It was a big week, and the number of yachts at the rendezvous seemed to be quite as large as in former years and the spirit of the yachtsmen was just as keen.

The yachts began to arrive on Sunday, July 15th, and one of the first vessels on the scene was Commodore Alex Winton's La Belle, on board of which was the Commodore; Henry J. Gielow, of New York; H. D. Freeman, of Columbus; C. D. Lynch, of Detroit, and G. H. Gardner, of Cleveland. The last three were to act as judges of the long-distance races.

The program of the week of racing was a varied one. Sailboats, power boats, and canoes furnished the sport, and in the evening there were dinners, concerts, receptions, a ball and, finally, the distribution of the prizes. Unfortunately the racing was in progress when this issue of THE RUDDER went to press, but a full account of this popular yachting week will be published next month.

The New York-Albany Race

Eight boats of the cruiser type started and finished within the time limit of 48 hours in the cruiser race from New York to Albany and return of the New York Motor Boat Club on June 30th, at 2 p. m. The limitation to the one class of boats was an innovation adopted by the race committee in order to bar out express cruisers, who were wont to capture all the glory and leave none for the slower boats. That this proved popular was demonstrated by thirteen or fourteen possible entrants, of whom eight actually started. The weather conditions were favorable and no trouble of moment was encountered by any of the contestants. The most troublesome were ignition failures and two cases of difficulty with circulation water hose connection failures. It is also reported that in the darkness of night two of the competitors chased one another around an island in the upper Hudson, each one believing he was following someone who knew where he was.

The first boat back, Luetta, Captain W. E. Little, reported a no-trouble run and the fact that she was able to outrun faster boats was due in a large measure to the superior boat handling of her crew, particularly during the night runs.

The fact that the committee was able to organize the race at all under the trying conditions at present is a credit to the club and competitors and only shows what the proper enthusiasm will do.

The Heleentje is owned by H. Benjamin, Cobweb Y. C.; Luetta, by W. E. Little, N. Y. M. B. C.; Helen B, by Wm. Bagley, N. Y. M. B. C.; Chipamunk, by G. T. Latimer & C. A. Crumm, Unity M. B. C.; Nahama, by R. V. Woffindin, Cobweb Y. C.; Kittie C II, by C. A. Carlson, N. Y. M. B. C.; Kid II, by C. H. Dugliss, Jr., N. Y. M. B. C.; and Maybelle V, by H. C. Vaughan, N. Y. M. B. C.

The race was managed by the regatta committee, H. J. Allen, chairman; C. H. Dugliss, Jr., W. H. Little, W. E. Latimer, W. T. Randolph. F. W. Horenburger was measurer.

The prize winners were: Heleentje, first; Luetta, second; Helen B, third. Time prize won by Luetta.

NEW YORK MOTOR BOAT CLUB'S NINTH ANNUAL RACE

NEW YORK-ALBANY—RETURN

Start, June 30, 1917, 2 P. M. Distance, 235 Nautical Miles

Boat	Water-Line Length Ft.	Water-Line Breadth Ft.	Engine	Cyl.	Cy.	Bore and Stroke Inches	H.P.	Rating 1917 A.P.B.A.	Time Allow. H. M. S.	Elapsed Time Up Trip H. M. S.	Elapsed Time Down Trip H. M. S.	Elapsed Time Total H. M. S.	Corrected Time H. M. S.	Aver. Speed Knots
Heleentje	26.25	7.33	Ferro	4	4	4x6	11.31	32.76	6:28:10	16:30:00	17:58:45	34:28:45	28:00:35	6.82
Luetta	29.00	7.29	Frisbie	3	4	6x6	23.33	39.82	1:10:51	14:32:00	15:06:26	29:38:26	28:27:35	7.95
Helen B	29.79	6.88	Sterling	4	4	4⅜x5½	17.08	38.43	2:03:32	15:27:00	15:04:20	30:31:20	28:27:48	7.72
Chipamunk	25.80	5.50	Palmer	2	2	4⅛x4½	9.78	35.54	4:08:28	15:25:00	18:18:35	33:43:35	29:35:07	6.95
Nahama	29.46	8.04	Sterling	4	4	5⅛x6¾	29.73	37.88	2:25:30	15:12:00	18:08:50	33:20:50	30:55:20	7.05
Kittie C II	25.75	5.81	Sterling	4	4	3¾x5½	13.66	41.83	Allows	15:40:00	15:24:50	31:04:50	31:04:50	7.68
Kid II	23.38	6 92	Tuttle	2	2	4⅛x4	7.28	31.64	7:31:37	20:12:00	19:50:30	40:02:30	32:30:53	5.88
Maybelle V.	28.46	7.08	Palmer	2	2	5x6	13.09	34.75	4:46:11	19:03:00	19:12:00	38:15:00	33:28:49	6.15

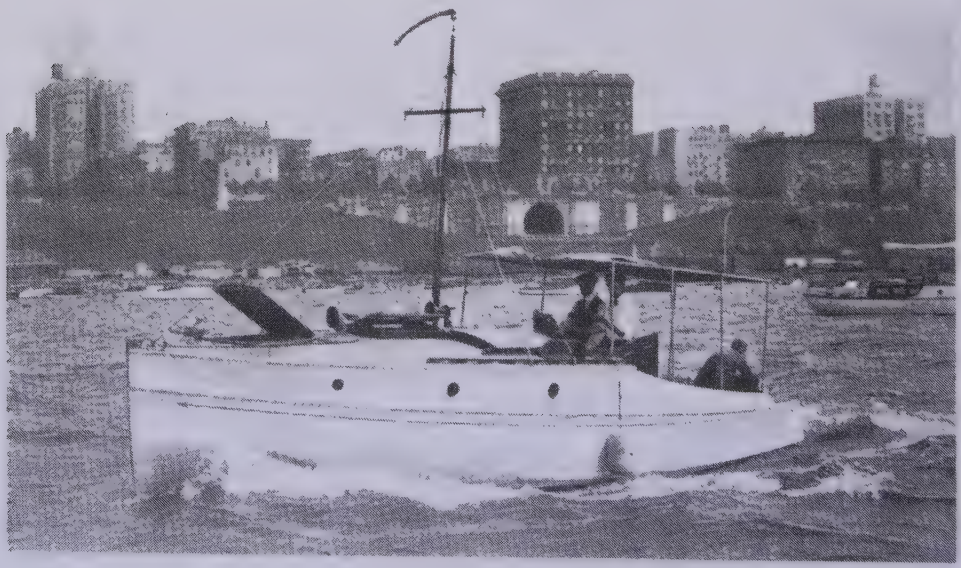
Larchmont's New Sloops

Four of the six sloops ordered by members of the Larchmont Y. C. last Fall are finished and are being tried out on the Sound. These yachts, designed by William Gardner, were built by Wood & McClure, and had the racing schedule this year been sailed through these yachts would have furnished some of the best sport of the season. The sloops have attracted much attention and have been very favorably commented on by those who have seen them sail and have handled them. The Larchmont Y. C. has called off its open regattas for the year, but many of the members are hoping that there will be some sport, and these favor holding some special races for club members and for the new class, as other clubs have done for their members. There seems to be no valid reason why these yachts should not be raced at times during the two months left of the yachting season.

One, the Varuna, owned by Commodore James B. Ford, carries the so-called Marconi rig and her spar towers way up in the air. It looks enormous compared with the masts of the other yachts, but Mr. Gardner has worked out the details with much care, and he is confident that it will stand and that the yacht under this rig will do well. The trials between the two rigs will furnish much interesting data, over which such experts as William Gardner, Addison G. Hanan, A. Bryan Alley, Clifford D. Mallory, W. Burton Hart, and others will ponder all through the winter months. It will be remembered that Addison G. Hanan last year tried a Marconi rig on the Nahma, the P Class sloop, and in trials with the Joyant the Nahma did well. Unfortunately, the rig had not been tried in a fresh wind when the series for the Manhasset Bay Cup began, and rather than risk carrying away Mr. Hanan changed back to the original sail plan of his sloop. Many think that with the Marconi rig she would have outsailed all the yachts in her class.

The new yachts have made a hit with the sailors who have seen them. They are as shapely as any type of yachts on these waters, thoroughly characteristic of Gardner designs in their graceful lines, and seemingly fast on all points of sailing. Speed must be a relative judgment until the yachts get into a contest with the New York Y. C. 40-footers and the P boats, as the new O Class boats are just midway of those two well-known types in size.

The new yachts are 58 feet over all, 38 feet 6 inches on the water-line, with a breadth of 12 feet at the widest part of their beam, and a draught of 7 feet 6 inches. They have a sail area of about 1,700 square feet, about 300 feet more than the Class P racers carry as an average. Carrying more sail in proportion to their displacement than do the P yachts, they should be relatively faster, and the finer and more graceful lines would also seem to indicate their ability to show more relative speed than the New York Y. C. 40-footers, even though the latter have the greater stretch of canvas.

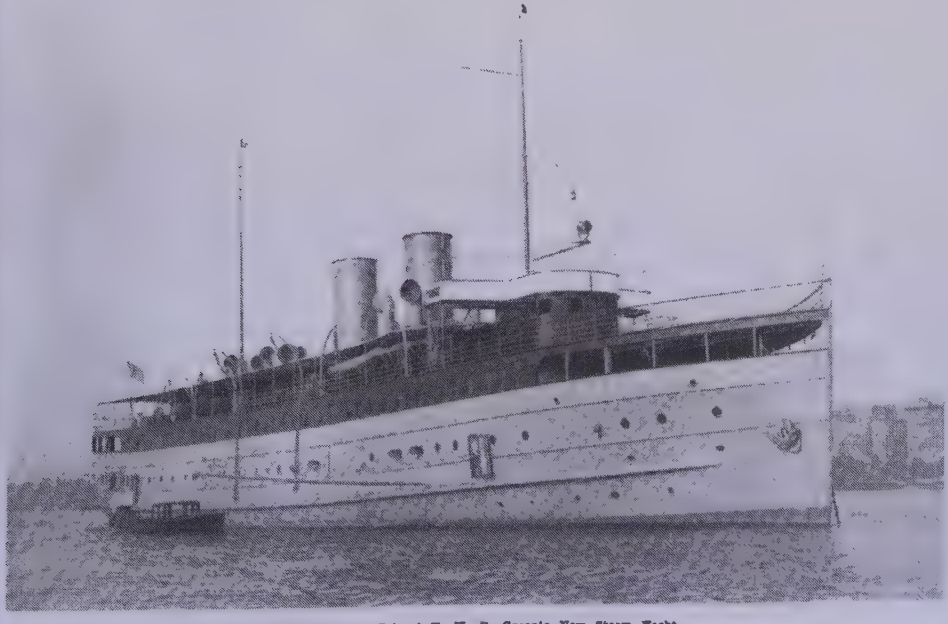


Luetta, W. E. Little, Owner. Winner of Time Prize in the New York-Albany Race. With a Prisbie Engine She Averaged 7.75 Knots

United States, Colonel E. H. R. Green's Palatial Yacht

THE United States is the largest, finest and costliest privately owned yacht in the world. Her gross tonnage is 2,054. The second largest is 112 tons less than this. She is really the most commodious vessel of her kind afloat, and has been designed and fitted with the idea of giving comfort and room to the owner and those who are fortunate enough to be his guests. She is rather unique as a yacht, and the first impression one gets on boarding this vessel is expanse, and if it were not for the crown and sheer to the decks and the view of the water through the windows one would seem to be more at home in some luxuriously fitted house than afloat on a yacht. The furnishings, too, rather suggest the house than the steamer. They are different in every way from the regulation yacht fittings, and are most artistic.

Colonel E. H. R. Green decided last Fall that he would like to have a yacht in which he might cruise along the coast during the heated spell and on the Gulf in the Winter. Waco, Texas, is Colonel Green's home, and while that town is not on the coast it would be in easy reach of the yacht. Colonel Green looked over all the large steam yachts which were in the market, but not one really appealed to him. He wanted room and comfort and he knew there was little comfort in the small staterooms which are to be found on so many of the larger yachts. Having failed to find just what he wanted in the yacht fleet, and as it was impossible to attempt building a new vessel for this season's use, he consulted the firm of Gielow & Orr and suggested that they look about for something that had been built for commercial use, and that might be transformed into a comfortable cruising yacht. The steamship United States, which had been in service on the Lakes, was found, and after a careful study and some planning it was decided that it could be altered into a most attractive vessel and fitted for Colonel Green's uses. The United States was built by the Manitowoc Dry Dock Company at Manitowoc, Wis. She is a well-constructed steel vessel, having a triple-expansion engine and Scotch boilers. Her original length was



United States. Colonel E. H. R. Green's New Steam Yacht

215 feet, and she was used as a passenger and light freight vessel, plying on Lake Michigan between Grand Haven and Milwaukee. The vessel was purchased and brought to New York, and on December 6th the plans for alterations were approved and the contract signed. The vessel was placed in the yards of the Robins Dry Dock & Repair Company in Brooklyn, and the work of transforming the vessel began at once.

First of all it had been decided to lengthen the vessel 40 feet, and to do this it was necessary to cut the hull, separate the two halves and construct the additional length between them. The United States was placed in a dry dock, and Mr. Gielow and his assistants took off her lines and figured just where the addition was to be placed and how the work was to be done. The boat was then floated out of the dock and the hull stripped of all woodwork, except the main decking and parts of the lower and upper decking. All of the structural parts for the additional length were then prepared in the shops, and when everything was ready the vessel was again dry-docked and the hull cut in two. The hull was cut beneath two of the boilers, and these had to be supported and moved with the forward half of the hull. The cutting occupied two days and nights, and it took just seven minutes afterwards to move the forward half, weighing about 420 tons, the whole distance of 40 feet. Careful measurements were then made to see that the two halves were properly lined up and plumb.

The lengthening has made the yacht measure 255 feet over all; her breadth is 40 feet and her loaded draught is 15 feet. Her engines of 2,500 i.h.p. will give her a speed of about 17 miles per hour.

A new upper deck was built, and a new promenade deck of Oregon pine on steel beams was constructed, with 9 inches more headroom between these decks than on the original boat. The yacht now has five decks—lower, main, upper, promenade and bridge deck. The flying wings of the bridge are 32 feet above the water-line. The additional length has greatly improved the appearance of the vessel, and it has given a large increase in interior space. The hull and the superstructure to the sill of the upper deck windows are now painted a navy gray, and the woodwork above this is finished bright. This woodwork is mahogany.



The Breakfast Room on the United States, Furnished in the Period of Louis Seize. A Modern Stabilizer Keeps the Table Level Even in Heavy Weather



Colonel and Mrs. Green (Seated). Mrs. W. H. Marshall and Miss Dorothy Marshall



The Dining Room, With Furniture of Walnut of the Period of Louis Quinze

The United States is fitted with two smokestacks (originally she had but one), has two polemasts which support the wireless antennæ, and carries in addition to her many lifeboats four mahogany launches, which Colonel Green has named Alaska, Hawaii, Antilles and Philippines, so that the yachts may be termed the United States and her possessions. These launches were built by the Gas Engine & Power Company. The Alaska is the largest, measuring 35 feet by 6 feet 6 inches, and is driven by a Speedway engine of 130 h.p. The Hawaii is 30 feet long, 6 feet 9 inches breadth, and is equipped with a 45-h.p. engine, and the other two are each 25 feet long, 6 feet breadth, and are equipped with engines of 28 h.p.

The bridge deck, which has the usual flying wings extending from rail to rail, also has a sun deck 24 feet by 15 feet, and from it a commanding view can be obtained because of its height above the water.

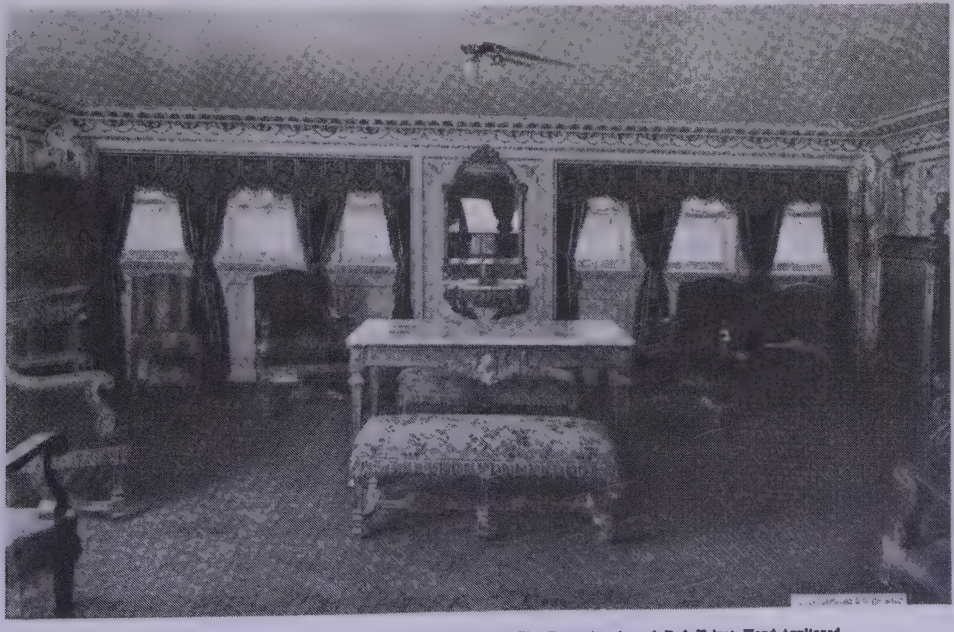
On the promenade deck forward is the pilothouse, fitted with everything up-to-date for the use of the captain and his officers in navigating the vessel. Just aft of this house is the captain's stateroom, which is finished in mahogany, and which has a connecting bathroom. The chart room is aft of the captain's room. This room is finished in silver gray ash, with leather upholstery in tobacco color. The window hangings, though of leather, are as light as a dainty fabric. The lighting fixtures and other hardware, such as hinges, escutcheons and push buttons, are of rusty iron, and are very artistic and simple in design. The whole room is distinctly Gothic in treatment. Aft of the chart room is a stairway, which may be reached through doors in both sides of the deckhouse, and which is one of the four ways of going below from this deck. On the walls at the head of the stairs, in its original but restored rich gold frame, is the copy of the Declaration of Independence which was given by Congress to the U. S. S. United States in 1819. Concealed in the deckhouse aft of this stairway is the boiler casing. The space between the boiler and engine casings is divided into a stateroom for the mates, another for the wireless operators with connecting bathroom, a wireless operating room, a washroom, and the tea room. This room is one of the most attractive on the yacht. Being a tea room it is appropriate that it should be finished and furnished as a Chinese room. The tables, chairs and the general decorations are all red and black lacquer. The upholstery and hangings are of Chinese design and Chinese fabric. The rug was especially woven for this yacht, and is a copy of a famous rug in the Palace at Peking. At the after end of the deckhouse there is a large shelter, 14 feet by 14 feet, which is cosily furnished with settees and chairs, and aft of this is a deck spacious enough for a big dance. This deck is 50 feet long and extends the full width of the yacht. On each side of the apartments on the promenade deck is wide deck space.

On the upper deck the crew has the open forward end, and their portion is separated from the owner's accommodations by a solid steel bulkhead, so that the crew is entirely cut off from apartments of the



The Tea Room on the Promenade Deck Is Chinese and the Color Scheme Is Red and Black Lacquer

owner and his guests. Aft of this bulkhead there is a library on the starboard side and a breakfast room on the port side. Aft of the library is the drawing room, and on the opposite side of the vessel is the dining room. These rooms are entered through the forward hall from which stairs lead to the promenade deck, and from which passageways and halls give access to the staterooms. These halls and passages have walls in large panels finished in white, with doors, door trim, handrails, stairs and balusters in brown mahogany with nickel-plated hardware and cut-glass door-knobs. The carpet is a very effective pepper-and-salt velvet one with a black border. Linen closets are placed everywhere, and the amount of storage space is enormous. The entrance to the drawing room is from the hall and the library is reached through the drawing room. In the same way the dining room can be entered from the hall on the port side and the breakfast room is reached through the dining room. The library is 12 feet by 15 feet. The woodwork is oak, waxed and rubbed, and ornamented with composition, the lighting fixtures are polychrome, and the upholstery and hangings are of maroon leather, giving a quiet subdued effect. A painting on one of the panels shows the Half-Moon entering the Hudson River, with surprised natives on the shores. One dainty piece in this room is a fine bronze elephant fern-holder standing on the bookcases in front of the windows. The drawing room is of the period of Louis Quatorze. The color scheme is red and gold, the furniture being gold and the upholstery red. An Italian marble table stands in the center of the room, and the hangings are red and gold silk velvet. The hardware and lighting fixtures are gold-plated, and in each corner of the room stands a handsome torchère. At one end is a large Victrola, the largest and best made, which is cased in a Louis Quatorze highboy. In the center of the outboard wall is a splendid console table surmounted by a mirror, which is flanked by two groups of three windows, each group in its overdraperies being treated as one. In the opposite wall is a doorway, having four dainty doors, paneled with glass and fitted with lace, through which one passes to the dining room. This room, like the drawing room, is 17 feet wide and 25 feet fore-and-aft. It is finished in the period of Louis Quinze. The furniture is walnut and the upholstery old gold haircloth. The chairs are covered with old gold haircloth and fitted with cane backs, the upper part of which is covered with an old gold haircloth valance. There are six windows in this room, of which the two center ones are vista windows, each 5 feet long. The breakfast room, which is the same size as the library, is furnished and decorated in the period of Louis Seize. The color scheme is cream and green with gold decorations. All the china and glass have been especially made from original designs by Higgins & Seiter, and, as is customary, each piece is enameled with the flag of the owner of the yacht. These four rooms occupy a space of 40 feet by 50 feet, and the furnishings are such as are rare in an artistically furnished house, and such as are almost unique in a yacht or any other vessel. There are no conventional sideboards with glass mirrors, no buffets, no settees



The Drawing Room Represents the Period of Louis Quatorze. The Draperies Are of Red Velvet Hand-Appliqued

or old-fashioned lounges, but everything is artistic and rich. The windows throughout have Austrian shades, with overcurtains and loops in the period or style of the room.

Adjoining the dining room is of course the butler's pantry, up-to-date, and fitted with just what should be found in a butler's pantry to enable the stewards to serve quietly and quickly. This room is finished in teak with nickel hardware. Next to this pantry on the port side are two staterooms fitted with two berths in each, a bathroom and a sitting room for maids, and on the opposite side are two double-berthed staterooms with connecting bathroom and a pressing room adjoining for the valets, and the pressing room is equipped with the most modern appliances for these to properly take care of their master's clothing.

The owner's stateroom is next aft on the starboard side. The bedroom, as it should properly be called, because one always associates smallness with the word stateroom, is 15 feet by 20 feet. The whole tone of the room is Georgian and distinctly mannish. The walls are in alternate large and small panels, with massive mouldings and trim.

The furniture is all of walnut, and consists of a large bedstead, a bureau, a highboy, a lounge, and chairs. The draperies are of old gold, and the lighting fixtures and other hardware are silver. A unique silver ship's clock, supported by a figure representing the head and shoulders of Uncle Sam, adorns one of the walls. A telephone connecting with every part of the vessel is handy to the bed. At the forward end is a bathroom, tiled and decorated with a dainty green pond lily frieze. Each bathroom is very large and complete, and includes such refinements as a dental lavatory and an adjustable height shaving light on each side of the mirror. The fittings in all the bathrooms are of red metal, a composition made to imitate the color of United States gold coins. Beyond the owner's bathroom is a large private storeroom for his trunks, or anything else he wishes to have handy. There is also connecting with the bedroom a very large wardrobe built of cedar and divided to hold the different articles of clothing.

The next stateroom is Marie Antoinette in design, and it is a dainty and queenly room. The decorations are in cafe au lait grey and delicate blue with gold electric light fittings. There are three full-length mirrors in each stateroom, one on a center panel and the others on the doors of the bathroom and the wardrobe arranged to form a triple mirror, which will be pleasing to the women. Further aft is a stateroom finished in cream, which represents the Colonial period, and another in old rose, with Chippendale furniture.

On the opposite side of the vessel there is a stateroom fitted and decorated in the light graceful style of the Adam Brothers, and one which is done throughout in strict accordance with the delicate style of Hepplewhite. A stunning room is one with Elizabethan period furniture of dark oak in a setting of medium width panels, whose upper portions are ornamented with paintings of gaudily colored parrots.

Altogether, there are nine of these master chambers, each having a bathroom adjoining and a large



The Living Room Is Jacobean or Early English in Design and Furnishings. It Has an Open Fireplace Where Logs May Be Burned

cedar wardrobe. Each is perfectly appointed from an artistic viewpoint, and represents some distinct period in artistic furnishings. All of the interior decorating and furnishing was done by John Wanamaker, whose department of interior furnishings gave much study to the decorative scheme, and took great care to have all the appointments perfect. Practically all of the movable furniture was made by the Shaw Furniture Company.

Aft of the sleeping quarters and beneath the dancing deck is another large deck space, which is fitted with hammocks and wicker furniture, and which will be used by those who are fond of fresh air and outdoor sleeping. Some idea of the commodiousness of the quarters may be gathered from the fact that as a passenger vessel she had eighty-three staterooms on her upper and promenade deck, where she now, with 40 feet of additional length, has but six living rooms, nine staterooms, and eight rooms for officers and personal servants. Outstanding features of the rooms on this deck are the very ample headroom; the numerous double sash windows, both sash sliding up into a pocket, giving full window opening in place of the customary one or two small circular port lights; and the flat ceilings unbroken by the customary beaming of ordinary yacht ceilings.

On the main deck on each side are the entrance lobbies which open into the lower after hall, in which is a stairway leading from these entrance lobbies to the upper deck. The living room is on the main deck, and is 28 feet long and 32 feet wide, and is furnished and decorated to represent the Jacobean period or, more accurately, the Tudor period of English oak rooms and furniture. At one end is a large stone fireplace for an open fire, with the characteristic leather fire-seat on a rusty iron fender. Above the mantle is a painting showing the U. S. Frigate United States, of forty-four guns, winning her fight with the Macedonian, of forty-nine guns, near the Canary Islands, on October 25, 1812. The gold medal presented by Congress to Commodore Decatur for this victory is now on board the new United States. The walls of the room are in light oak. The chairs and lounges are upholstered in handsome tapestry, and in one end of the room, hidden by the paneling, is a Welte-Philharmonic self-playing organ. A piano occupies space at the after end, and a large lion skin covers a part of the rich carpet in front of the fireplace. Forward of the living room on the starboard side is the owner's office, having paneled mahogany wainscoating, surmounted by large white panels, and fitted with mahogany furniture. Then comes a washroom, the barber shop, gymnasium, and a hydrotherapeutic room.

Down below the main deck are eight watertight compartments, providing ample space for two forecastles, refrigerating plant, three Scotch boilers, the engine room and numerous storerooms. Many alterations to the machinery were necessitated by the change

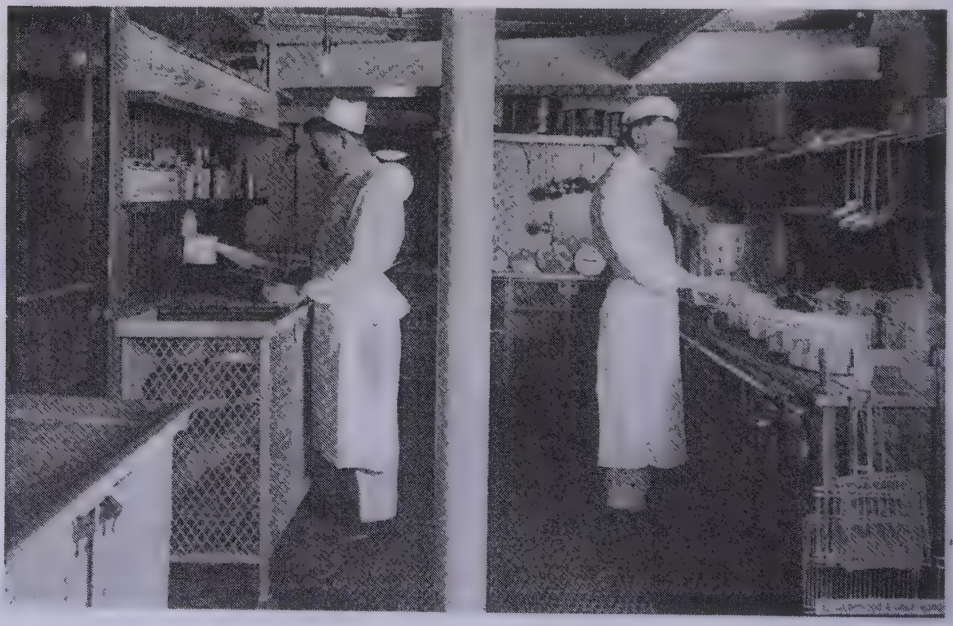


A Dainty Bedroom of the Louis Seize Period

from a fresh-water to a salt-water boat, including the installation of a condenser, a circulating pump and an air pump, and the building of numerous tanks to carry the fresh-water supply, which on the Lakes is taken directly from outboard. Entirely new piping was fitted throughout the vessel for steam, exhaust, water, sanitary bilge and fire purposes. The only thing that remains of her old electric plant is the generators. The storage battery, switchboard, all conduits, wiring and fixtures are new, and were all supplied and installed by the Smith Meeker Engineering Company. The refrigerating plant was put in by the Clothel Company. The plant consists of two independent machines, one of which is ample for use in cool climates, and both will take care of the supplies when the vessel is used in heated zones. The hold refrigerator is divided into four separate compartments —one for meats, another for vegetables and fruit, another for butter, eggs and milk, and a fourth for fish. The inside measurement of this refrigerator is 15 feet by 20 feet by 7 feet. There are also two galley boxes, a pantry box, an ice-making box, having a capacity of 200 lb of ice each day. Refrigerated drinking water is piped to the officers' and crew's messrooms, the engine room and the fire room. The yacht is heated and ventilated by two Thermofans of 6,000 cubic feet capacity, which heat, cook or humidify the air by forcing air over cooled or heated pipes. The bunkers have a capacity of 530 tons, and the water tanks will hold 125 tons of water. The United States is the most complete and up-to-date yacht now afloat.

Nothing that could be done to make the United States the most perfectly fitted vessel afloat has been neglected by Gielow & Orr, who had absolute charge of the reconstruction and the fitting-out, and on board are to be found many comforts and conveniences that are missing in the best appointed houses. The vessel itself, while technically a yacht because it is used for private purposes and not for commerce, is really a floating house. There is room everywhere. Instead of cutting up the interior into small rooms, there are comparatively few rooms, and each one has length, breadth and height. One can move about without feeling cramped, and each apartment is so thoroughly well ventilated with its big windows, its electric fans and the system for heating and cooling, that it will be cool and comfortable in Summer and warm in Winter. The lighting scheme too has been carefully thought out, and much thought has been given to every part of the vessel from the keel up to the sun deck.

The chief inspector throughout the period of alteration was Colonel Green, who derived much pleasure from his almost daily visits to the work, and who was ably assisted on many of his inspection trips by Mrs. Green, who was Miss Mabel Harlow. The yacht is now a honeymoon ship, and the Colonel says he intends that she always shall be.



The Galley, Large Enough For a Hotel

"The Marines Have Landed"

By Walter Scott Meriwether

OVERNIGHT as it were, our soldiers of the sea, the United States marines, emerged from the obscurity of every-day work well done, and sailed into sudden fame as an important unit of the expeditionary force that has been landed in France.

A correspondent reported that one of the German prisoners doing stevedore work on the pier where the marines were being disembarked, looked sullenly at the contingent and said to one: "You won't be fighting Mexican greasers when you get to our fighting line."



Marching From the Barracks to the Trains



Boarding the Train Which Carried Them to Transports

It is not recorded that the marine made any reply to the implied doubt as to whether the marines will stand the European racket. They will face it all right, have no concern about that. For nowhere on this war-rent rolling ball has any body of soldiery ever displayed greater steadiness than the United States marines, and there is nowhere a more highly disciplined or more dependable body,—qualities they have exhibited for more than one hundred years in almost every section of the globe, in Tripoli, in the storming of Chapultepec, in numerous battles of the Civil War, in Egypt, Japan, Korea, Formosa, in the Boxer uprising in China, where a battalion still guards the American Legation; in Cuba, Porto Rico, Nicaragua, Panama, in the second occupation of Vera Cruz, where they bore the brunt of the assault, and more recently in Haiti and San Domingo.

Preceded by their band, "Trumpets of the vanguard that has sworn no truce with Kings," the marines flowed over the gangplanks of their waiting transports and sailed away for the battle lines in France, the two regiments numbering 2,700 men, and under the command of Lieutenant-Colonel C. A. Doyen, himself a veteran of many campaigns. Many of the brigade showed the tan of a tropic sun, for a large number of the contingent had just been withdrawn from the work of bringing order into the Black Republic, a work that involved the occupa-



Colonel Wendell C. Nevill, Commanding the Legation Guard at Peking



Major-General George Barnett, Commandant U. S. Marine Corps



Colonel Charles A. Doyen, Who Leads a Regiment of 2,700 Now in France



Happy-Faced, Sun-Browned Veterans Waving Campaign Hats as Train Started



Major-General Barnett (Right) Wishing Colonel C. A. Doyen God's Speed

tion of Port-au-Prince and of all the seaports of Haiti, much street and jungle fighting, and the pursuit of insurgents into their mountain fastnesses.

One would suppose that this would have been a job for the army rather than for men primarily trained for shipboard duties. But the marines were selected for the work and they did it in their usual expeditious and thorough fashion. They took with them some armored motor cars and successfully landed them through a heavy surf—a difficult enterprise even for skilled seamen. But the marine, as you may know, is a

"Bloomin' cosmopolouse, soldier and sailor."

Time was when the navy sailor regarded the marine with extreme disfavor. That was when the two went to sea in the full-rigged ships of the old navy, when the bluejackets manned the batteries and handled the vessels, the marines being merely a ship police force in time of peace and sometimes supernumerary members of gun crews in time of war.

There is an incident I recall which illustrates the attitude of the old-time bluejackets towards their marine shipmates, a reminiscence which has an added interest from the fact that two officers who figure in it are now with our fighting forces abroad, these being Vice-Admiral Sims, commanding our destroyer flotilla operating with the naval forces of our allies, and Lieutenant-Colonel Doyen, commanding the marine brigade in France.

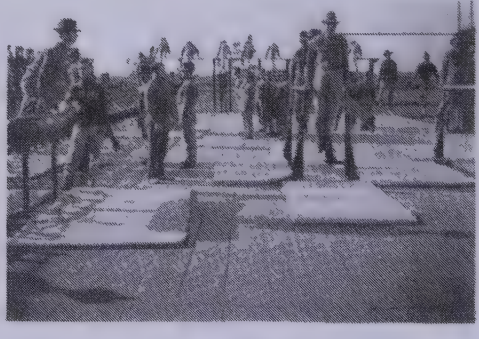
It was on board the old corvette Swatara, on which I was serving at the time. Sims, then an ensign, and Doyen, a second lieutenant of marines, were shipmates on the same vessel. The Swatara joined company with the steam frigate Tennessee, flagship of the station, and then came "Admiral's inspection," a red-letter day in the affairs of flagship consorts, the Commander-in-Chief in full regalia and his glittering staff coming on board to see how well or ill the crew had been drilled in its various duties.

Sims commanded the 8-inch pivot rifle, whose crew was composed of bluejackets, whose numbers at the gun ranged from 1 to 18, and eight of Doyen's marines, whose numbers ran from 19 to 26. The Admiral, the late George F. Cooper, progressed with his staff to the pivot rifle, where one of his aides began questioning the various members of the gun's crew about their several duties. Among the crew was seaman O'Brien, nicknamed "Flatfoot," the most solemn owl that ever wore bluejacket rig.

"If you were No. 1 at this gun what would you be?" the aide asked O'Brien, who gave the correct answer. He was asked several more questions along the same line and then the aide said:



Making Historical Records of the Departure For France



Marines as Athletes



Marines as Field Artillerymen

"Now if you were No. 20, what would you be?"

O'Brien's jaw dropped and he gazed at his questioner like one appalled. The aide repeated the question, but O'Brien did not answer.

"Come, speak up!" the aide sharply admonished, "what would you be if you were No. 20?"

"My God!" said O'Brien, in an awestruck voice, "I'd be a —— marine!" And he looked helplessly around as though utterly overcome by a fate so appalling.

But the old prejudice long since disappeared and nowadays bluejackets and marines fraternize as one body. For with the coming of the new steel-clad fleets came instruction at the various naval training stations in "battleship" seamanship, an instruction that is now



Advance Base Work. Mounting a 6-Inch Gun at Culebra

given to marines almost to the same extent that it is given to the bluejackets. But, in addition, they are taught so very much else that there is much of truth in the lines which assert that

"There isn't a job on the top of the earth
The beggar don't know or do."

They are drilled so well in the manual of arms that it was once an old saying on shipboard that they could do anything with a rifle—except shoot it. But through intensive target practice most every one of the corps is now an expert rifle shot. Besides being drilled in all the duties of the soldier, they are trained in the use of field artillery and to act as machine gun companies. They are also trained in aviation, in the use of portable searchlights, the wireless telegraph, the heliograph, and the various other methods of signaling; range finding, the erection, operation and maintenance of telegraph and telephone lines, the planting of land and submarine mines, the handling of torpedoes, the erection and demolition of bridges, the building of roads, knotting and splicing of ropes, handling boats under oars and sails, the handling of heavy weights, the fitting of gun gear, and the various methods of slinging and transporting ordnance, and the



Operating a Field Telegraph

mounting in suitable shore positions of guns of 3, 5, and 6-inch calibre. In their service on battleships and cruisers, the marines now form a part of the ship's complement for battle, manning the guns of the intermediate and secondary batteries, and anti-aircraft guns.

What a glorious history the United States marines have. It is the oldest branch of the service and was organized before either the Army or the Navy. On November 10, 1775, before a single vessel of the Navy was sent to sea, the Continental Congress authorized the raising of two battalions of marines. On April 27, 1805, Lieutenant P. N. O'Bannon, of the Marine Corps, hoisted the first American flag over a fortress of the old world, when Derne, a stronghold in Tripoli, was taken. The United States marines were first to enter the fortress Chapultepec in Mexico City, on September 13, 1847. The United States marines, under Colonel Robert E. Lee, captured John Brown at Harpers Ferry. The marines were the first Ameri-



The Marines Who Guard the Legation at Peking



Landing in San Domingo With Armored Motor Car



Insignia of the Marine Corps

can troops to land in Cuba in 1898. They were the first troops to enter Peking, China, just before the Boxer Rebellion in 1900. They were the first to enter Vera Cruz in April, 1914. They are now pacifying Haiti. They are guarding the American Legation at Peking. They have carried their flag in action in Tripoli, Egypt, West Africa, the Fiji Islands, Sumatra, Hawaii, Mexico, China, Uruguay, Paraguay, Alaska, Panama, Formosa, Korea, Cuba, San Domingo and other places, and are now first to land in France.

Colonel Doyen's 2,700 men caused a sensation when they landed in France, not only by their fine appearance and the way they marched but by the way they buckled down to work at once, getting their supplies in shape almost as soon as they were on shore, and the thoroughly businesslike way in which they did everything they tackled. They will stimulate the spirits of the soldiers of the Allies, who have been holding the lines for three years, and their added weight will ultimately lead on to victory.



Living Up to the Traditions of the United States Marines, Colonel Doyen's 2,700 Men Were the First of the American Troops to Land in France. They Are Shown Here Busily Engaged Getting Their Stores and Supplies Ashore

The Boom in Ship-Building

CONGRESS recently appropriated $800,000,000 for the use of the United States Shipping Board. Of this sum $50,000,000 was appropriated when the Board was created, $500,000,000 is for ship-building, and $250,000,000 is to be used for commandeering existing shipping and shipping under construction. Now Chairman Denman has asked for an additional $500,000,000 and if President Wilson approves, a bill will be introduced in Congress. Mr. Denman says that contracts amounting in value to $550,000,000 have already been let or would be in the near future. The additional appropriation, according to the head of the Shipping Board, with what has already been appropriated, will pay for 6,000,000 tons dead weight of cargo-carrying vessels, two-thirds of which will be built within the next eighteen months.

These are huge figures and they mean that there is to be a tremendous boom in the shipbuilding interests in this country. If one-half of these vessels are of wood of, say, 3,000 tons each, and the other half of steel of 5,000 tons each, it will mean a fleet of one thousand wooden vessels and six hundred steel vessels. Then one wonders where the engines, the equipment, the nautical instruments, the navigators and the other officers and the sailors are to come from.

Shipbuilding yards are growing like mushrooms. Many are reputable concerns. Some are money-making schemes, their promoters simply organizing a company, securing some site with perhaps a little plant, and then unloading the shares of stock on a gullible public. The promoters of these concerns picture untold wealth for the subscribers to their stock and, unfortunately for these subscribers, many have already been bitten rather severely. While there is no doubt that there is lots of work to be done in ship-building and that much money will be made by some out of these new ships, it will go to those who are experienced in the work, those who are solid, substantial concerns with good backing and with capable men in charge who can engineer the work properly.

Contracts for many wooden vessels have been placed and, judging by one vessel that arrived in New York a few weeks ago, some of these wooden vessels hurriedly constructed will not last long. This vessel was built in a Southern yard, of green timber. She had her engines at the stern and the general arrangement was very similar to the tank steamers of the Lakes. She was hogged so badly that she had some difficulty in reaching port safely and now much work will have to be done to strengthen her and put her in shape for service. Wooden ships poorly constructed will be of little value and experts still differ as to the advisability of building so many wooden vessels. Some point to the long lives of the wooden vessels now in trade, but those vessels were stanchly built of well-seasoned and selected lumber, and the men who built them were veterans at the work and prided themselves on the results of their efforts. The critics of the wooden vessels declare that they will be of little use after the war and they say too that, with proper standardized methods of fabrication, the steel vessels will be turned out faster than will the wooden ones and that they will last longer and be much more valuable when the war is over. Each type of vessel has its supporters and Mr. Denman favors the wooden vessel while General Goethals favors the steel vessel.

One thing, however, that must be taken into consideration is the labor situation. Where are the experienced shipbuilders to be found who can build this huge fleet, whether of wood or of steel? House carpenters have lots to learn before they are efficient shipwrights and structural steel workers are not the men to set up and rivet steel plates to frames. An experienced naval engineer said: "It is possible to turn out the



Three Wooden Cargo Carriers on the Ways at the Yards of the St. Helena Shipbuilding Co. at St. Helena, Oregon. The S. T. Allard is in the Center and the City of St. Helena on the Left

frames in large quantities and to turn them out quickly. The plates can be rolled and cut and the holes punched for the rivets but it is the riveting that takes the time and needs the experienced man. The length of time it will take to build a steel vessel or a dozen steel vessels depends entirely on the number of riveters employed." Just now riveters are scarce and they are not overtaxing their efforts. These workers say the Government is wealthy, the bosses are making money, and they are going to get their share. This engineer watched the work of two gangs of riveters, six men, employed in a large yard recently and found that in their day of eight hours they had rounded up and smoothed off just forty rivets. If this is the way the men are going to work on the new ships it will be many months before the vessels are ready to take on their cargoes and by that time, perhaps, the necessary nautical instruments will be made and the navigators and sailors will be ready to take charge.

While numerous concerns are to build the wooden vessels, so far just two are to work on the steel vessels. These are the Electric Boat Company and the American International Company. The Electric Boat Company will build on Newark Bay and the other company on the Delaware. The Electric Boat Company has purchased 125 acres of waterfront property on Newark Bay, opposite the site of the Elco Company at Bayonne. This plant is now being erected as fast as possible and it is planned to build two hundred steel vessels of 5,000 tons each. This work will be done along standardized designs from structural steel. What is termed Class A structural steel will be used, which has a tensile strength of about 55,000 lb. Henry R. Sutphen has worked out the whole scheme and will put into larger practice the experience he obtained in building the five hundred and fifty patrol boats for the British. When Major-General Goethals was put in charge of the Emergency Fleet Corporation, Mr. Sutphen at once put before him the plan to build of steel by fabrication process. The plan so impressed General Goethals that he immediately got to work on it and succeeded in interesting the steel companies. The work of building the steel vessels will start as soon as the plant is built and equipped, and that will be very soon.

President Wilson a few weeks ago apparently smoothed the friction that existed between the Shipping Board and the Emergency Fleet Corporation. He wrote to General Goethals, telling him that he was to have absolute control of the building of the ships, and Chairman Denman was told to attend to the operation of these ships as built. General Goethals, who has brought order out of chaos, then announced his plans which, briefly, are as follows:

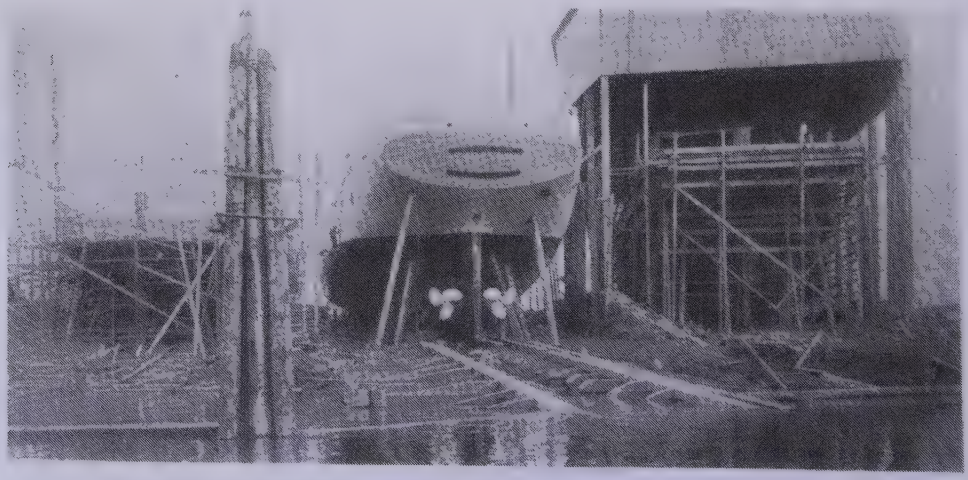
Contracts for three hundred and forty-eight wooden ships have been let or agreed upon with a tonnage capacity of 1,218,000 tons at a cost, completed, of $174,000,000. Contracts for one hundred wooden ships are under negotiation.

Contracts for seventy-seven steel vessels have been let with a tonnage of 642,000 tons at a cost of $101,660,356.

Thus four hundred and twenty-five ships, with an aggregate tonnage of 1,860,000, have been provided for at a cost of approximately $275,000,000, besides one hundred more wooden ships under negotiation.

General Goethals then goes on to tell that his main reliance for getting ships is on the construction of fabricated steel ships of standard pattern. Two Government plants are to be built to produce four hundred ships of an aggregate tonnage capacity of 2,500,000 tons within the next eighteen or twenty months. The agents who undertake the work are to receive 6% of the total cost. This contract will give the Government the benefit of the fixed commodity prices.

General Goethals also announced that he would commandeer all vessels now under construction in private yards amounting to more than 1,500,000 tons. Before he was allowed to do this, however, Chairman Denman of the Shipping Board put a stop to the work by issuing a statement which said that such action



S. T. Allard, Five-Masted Schooner, Ready for Launching at Astoria, Ore. One of the Big Fleet of Wooden Vessels Now Building

would have to be approved by the Board. This has upset everything. Although five months have elapsed since the Shipping Board was organized really very little has been done. In the opinion of many the President will now have to take a hand in the matter. The opponents of General Goethals say that he has not availed himself of the possibility of the wooden ship. The General says it takes eight months to build a wooden ship, while his critics say sixty days is long enough time. Practical shipbuilders are with General Goethals. One reason General Goethals is opposed to the wooden ship is that very few ways now exist on which these vessels can be built. It takes at least four months to build ways. Where contracts have been let, the work is delayed in many instances because of the time required to build the ways. It will take six months to erect ways and the plant for the building of steel vessels. While that is being done the steel mills will be fabricating the many parts and in about a year one hundred vessels will be ready for delivery, and after that the two plants will turn out one hundred every four months.

Bernard N. Baker, who was a member of the Shipping Board and the only practical shipping man on that Board, declares that some men who know something about ships should be associated with General Goethals. Mr. Baker says Mr. Denman's sole qualification for the post he holds was that he had had some experience in prosecuting claims against other nations for alleged infringement of our rights at sea. Mr. Baker says the wooden ship program is impractical, that it is slower than the steel ship program, that it is impossible to obtain seasoned lumber, and that steel or composite vessels can be turned out faster than wooden ships.

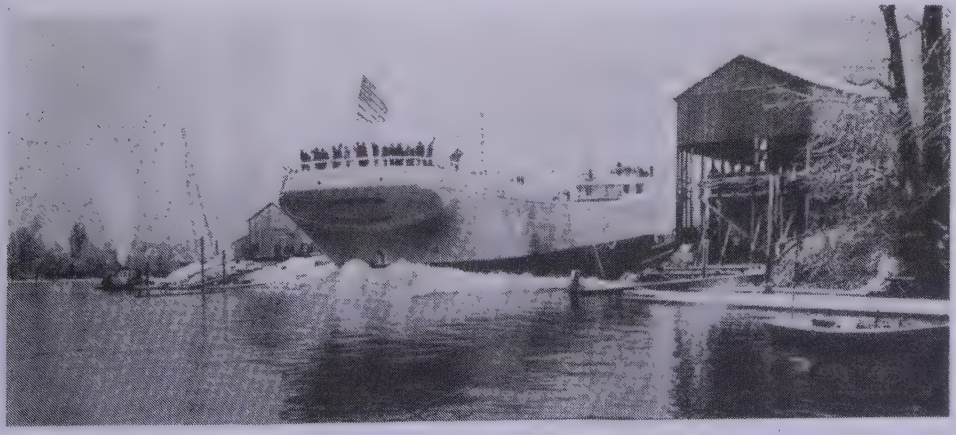
The submarines are sinking about 1,000,000 tons of shipping a month. Between April 14th and July 15th, thirteen weeks, the British lost three hundred and eighty-five vessels, of which two hundred and eighty-three were over 1,600 tons and one hundred and two under 1,600 tons. In addition to these, vessels of the United States, France, Italy, and Russia have been sunk, and the neutrals have lost many ships.

The Shipping Board was organized before the war, that is, before this country entered the war. Its work now is to turn out vessels to overcome the losses through the submarines. Practical shipping men say that Chairman Denman is wrong and that Major-General Goethals is right. They should know. General Goethals is not a shipping man, but he is an engineer and a great administrator. He has found out that steel vessels, which will also be serviceable after the war, can be built faster than wooden ships; but Chairman Denman, who has always been allied with the wooden ship interests, is loyal to his friends and holds up the steel ship program. If it is held up much longer the uses to which these ships are to be put will have passed.

In the meantime shipbuilding yards and plants are growing everywhere that proper water frontage can be found. The success of these yards, large and small, will depend on its efficiency and proper equipment. Charles Desmond, a naval engineer of marked ability and well known to readers of THE RUDDER, has now in preparation a book on wooden ship construction and their equipment and he devotes the first chapter to the building of launching ways. After a vessel has been built, it is most important that it should be successfully transferred to the water, and this is an engineer's job. It is not so easy as one Shipping Board official seemed to think it was. A builder went to the Board some weeks ago and asked for the privilege of building two wooden cargo-carriers. The official approached asked a few questions about the equipment of his yard and its capabilities, and then asked, "Is there any vacant land adjoining your property?"

When told there was lots, he added, "Then you can build twenty boats." The shipbuilder tried to explain that he had only two sets of launching ways and he would not be able to get the other eighteen boats off the land. This statement was, however, lost on the Shipping Board official, who declared that the launching was an easy matter.

In view of the interest in the building of cargo vessels and the development of shipbuilding plants, THE RUDDER publishes herewith the article on launching ways.



Five-Masted Schooner S. T. Allard, Being Launched From the St. Helens Yards; Length O. A. 265 Ft., Breadth 48 Ft., Depth 28 Ft.

Building Slips and Launching Ways

PART I

THE ground upon which a vessel is built is termed the building *slip*, or *berth*, and the fixed timbers that carry vessel from building slip into the water are called *launching ways*.

Both building slip and ways must have a firm foundation and be laid at proper inclinations; and one of the most important details in connection with laying out a shipyard is correct planning and construction of building slips and ways.

The first essential is that the foundation be sufficiently solid to bear the maximum load that will have to be carried, and this solidity must be *alike* for the entire length and width of building slip and ways.

The universally adopted and most practical method of getting the necessary solidity of foundation in a small shipyard is to drive a sufficient number of rows of piles into the ground at proper locations to support keel blocking, ways and staging, spacing them as close as necessary to attain the desired end. The tops of the piles are then cut off at proper height and capped with timbers, placed at right angles to launching direction, extending sufficiently far out each side of keel position to cover keel and launching way piles and allow all bilge, bottom, and staging supports to be placed on them.

When constructing a building slip of this kind the ground is leveled to some desirable inclination and piles driven and cut off to inclination selected for slip, then the athwartships caps are placed over piles and fastened and slip filled in with cinders, or other suitable material, to a proper height to make a good platform for the men working under vessel during construction.

Very often the portion of slip from land end down to where stern of vessel will be when being built is filled in level with top of caps, then from this point to a little below the low-water level the slip is floored over for about three-quarters of its width. From the low-water level the slip extends into water a sufficient distance to give the required launching depth of water over ends of launching ways, this portion of slip consisting of rows of piles, to act as bearers for launching ways, cut off at proper inclination and height and capped longitudinally. Cross capping is not generally used here, because it is likely to interfere with launching of vessel. Fig. 1 shows plan of such a building slip.

Inclination of Slip

While the contour of ground upon which a building slip is placed, the length of ground available for the land end of slip, depth of water at end of slipway, and width of channel available for free launching purposes, are things that must be carefully considered when selecting the most suitable inclination for building slip, the inclination that keel will be laid at, and inclination of launching ways necessary to insure a successful launching of the largest and smallest vessels likely to be built upon the slip must also be considered as a part of the problem.

The nearer the longitudinal inclination of slip is to the average inclination of launching ways the better. An inclination of about 4° to the horizon seems to be excellent for slips that are used for the construction of vessels of moderate tonnage and length.

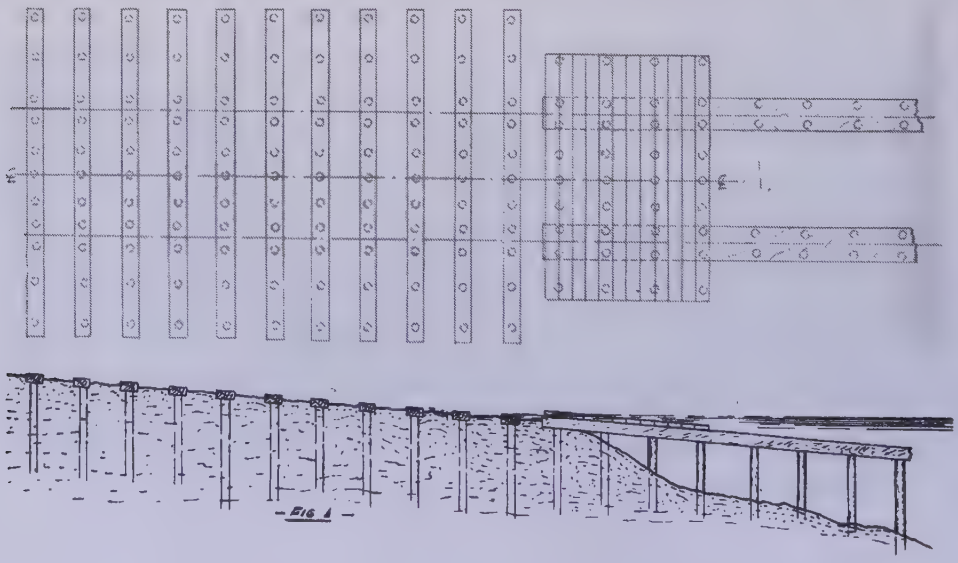


FIG 1

In reality the inclination of slip floor is a matter of minor importance so long as the inclination is one that will give a good working platform for men and permit proper shoring and securing of keel blocks and launching ways.

On slips constructed in manner described, the keel blocking and launching ways are set up for vessel and arranged at inclinations that are considered most suitable.

A more costly kind of building slip is constructed in this manner:

After the ground is piled in manner already explained the piles are cut off at, or near to, the average launching inclination and sufficiently low down to bring top of cap timbers a few inches below the desired level of building slip floor. The cap timbers are then used as supports for a flooring which is laid, longitudinally, over that portion of slip, except its center where keel will come, that is above the low-water level.

The longitudinal planking of slip floor that comes near places where launching ways will be laid is generally made out of much heavier material than floor proper and forms a permanent longitudinal stringer, or foundation, on which the launching ways can be laid.

The portion of slip below low-water point is constructed in manner already described.

A still more costly and permanent style of building slip is one constructed on concrete foundations set on piles cut off some distance below the level of ground.

Slips constructed in this manner are generally covered with a steel structure and fitted with traveling overhead crane for handling material used in the construction of vessels.

In all cases when laying out a building slip it is very necessary to carefully plan for economical moving and placing of construction material in position on vessel.

For a small shipyard one of the most economical methods of doing this is to lay rails on one or both sides of slip and from slip to places in yard where the material will be converted and got ready for erection. Then by using a traveling hoist of sufficient capacity the heaviest piece of material can be moved and lifted into position without having to use costly hand labor. If a method of this kind is used, level runways for the rails on which hoist will travel must be erected each side of slip and sufficient space allowed between adjacent slips to permit hoist to pass between the vessels and be properly operated.

The number of piles required for a slip will vary with nature of ground and weight of vessel to be carried and should be carefully calculated before commencing work.

The most reliable way to ascertain the carrying power of piles is by actual experiment with piles driven into the ground where the slip is to be built. This experiment can be made by driving about two piles a selected distance apart, connecting them together and building a rigid platform on top. Then by loading platform until the weight begins to sink piles further into the ground the maximum carrying weight per square foot of surface, or per pile, will be ascertained. This carrying weight must be in excess of the requirements.

The carrying weight value of piling can be determined with a sufficient degree of accuracy for ordinary conditions by making use of this formula:

$$\text{Safe carrying load in pounds} = \frac{2\ W\ H}{S + 1}$$

W = weight of hammer in pounds.
H = fall of hammer in feet.
S = average penetration of pile in ground during last five blows.

Assuming that a 1,000-lb hammer is used and that average penetration for last five blows is 6 inches and fall is 15 feet, the safe load for pile is 4,286 lb.

$$\frac{2 \times 1{,}000 \times 15}{6 + 1} = \frac{30{,}000}{7} = 4{,}286 \text{ lb.}$$

This rule is a fairly accurate one to use when average conditions prevail, but it must be recognized that nature of soil largely determines length of pile necessary.

The following table of bearing value of piles in various kinds of soils will prove of value as a guide:

Nature of Soil	Length of Pile in Feet	Average Dia. in Inches Whole Length. Inches	Average Penetration in In. Last Five Blows. Inches	Load in Tons Pile Carried. Tons
Mud	30	8	2	6
Soft earth	30	8	1½	7
Soft clay	30	8	1	9
Quicksand	30	8	½	12
Firm earth	30	8	¼	12
Sand	20	8	Solid	18
Gravel	15	8	Solid	18

It is safe to say this: No pile should be less than 5 inches in diameter at small end and 10 inches at large for 20 feet length of driving, or 12 inches for 30 feet, and no pile should be expected to carry more than 18 tons, even under the best conditions of ground and location.

Piles for foundations of building slips should not be spaced closer than 2 feet 6 inches. If spaced closer than this there is danger of the ground being broken up and holding power of adjacent piles lessened. A good plan is to use two, three, or four rows of piles under center of slip to act as supports for keel blocks; two, three, or four more closely spaced rows each side to form supports for launching ways, and additional intermediate and outside piles if ground is soft and weight to be carried is excessive.

Of course the cross caps will connect these rows of piles and make a level and evenly supported athwartships bearing surface for keel blocks and launching ways.

The longitudinal spacing will depend somewhat upon weight to be carried and length of vessel that will be built on ship, but it should always be remembered that spacing must be sufficiently close to allow two cross caps to be used as supports for the lower pieces of each keel block in cases where blocking has to be sufficiently high to warrant cribbing it.

Length and Width of Building Slips

The length of that portion of the building slip that is above high-water mark should be at least one and a half times the length of longest vessel that will be constructed on slip; and there must always be sufficient distance between stern post and water to allow vessel to attain a safe launching velocity before it reaches a depth of water sufficient to reduce speed to a point where the slightest obstruction might cause vessel to stick on ways. The distance that longitudinal underwater portion of slip extends out must be sufficient to give firm support to launching ways until vessel becomes water-borne, or "tips." Therefore determine launching draught of the largest vessel likely to be built on slip, and have the ends of slipway extend out a sufficient distance from

shore to give more than the required depth of water when tipping occurs. The tipping can be considered to occur when the longitudinal center of vessel is over ends of way.

The width of building slip must be sufficient to permit the building of the widest vessel, the erection of proper staging, and the handling of material on each side.

Four important width measures must be selected.

1st.—The width of blocking necessary to support keel.

2d.—The width required for launching ways and distance the center of ways will be out from center line of keel.

3d.—The extreme width of slip necessary for erecting staging around vessel.

4th.—The additional width required for handling material along sides of slip.

The first can be considered to be about 4 feet, therefore, piles should be sufficiently closely spaced throughout the whole length of slip, for 2 feet each side of its center line, to carry all the weight that must be supported on keel blocks during construction.

Launching ways are generally placed about one-third extreme breadth of a vessel apart. So consider that one-sixth the width of widest vessel likely to be built on slip as distance that center of launching ways supporting piles must be out from center line of slip and have one line of piles driven along this line, two lines of piles outside of it, and three or four lines inside of it. This will give six or seven lines of piles for supporting launching ways and a sufficiently wide support to take care of ordinary variations of width of launching ways.

The width necessary to erect staging around vessel should be added to extreme width of vessel, and the width required for handling material should be measured from outside of staging supports.

Always leave ample room between adjacent slips for the operation of hoist and handling the largest pieces of material.

Inclination of Keel Blocking

Keel blocking is the name given to the blocks upon which a vessel's keel is laid and weight of vessel carried until it is transferred to the launching ways immediately before launching. The height of keel blocks must be such that bottom of vessel's keel and frame will be sufficiently high above the ground of slip, or slip floor, for the workmen to do the necessary construction work, and the inclination relative to slip and launching ways must be such that the forefoot of vessel will clear the lower end of slip by at least 10 inches when vessel is being launched. Bear in mind that the inclination of top of keel blocks determines the inclination keel will have during launching, and that the keel of vessel does not have to be at the same inclination as launching ways or building slip floor.

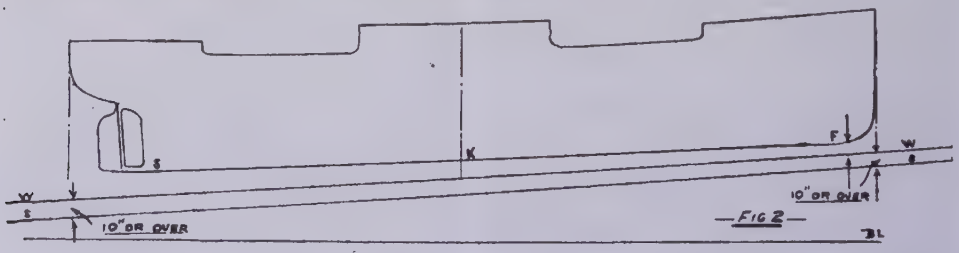
To determine the required height and inclination of keel blocks proceed in this manner:

Lay out on a piece of drawing paper, to proper scale, lines to indicate correct length and inclination of slip floor and inclination that you intend the launching ways to have. Next mark points on these lines where forefoot, midship section and stern post of vessel will be located during construction. The height that keel of vessel must be above ground to insure ample working space under vessel for the men who will do the construction work must next be determined, and it is best to determine this height for the midship section position because that will be flattest and widest point of bottom of vessel.

Having determined the height keel must be above slip floor at midship section, measure off this height on drawing, and also measure off at lower end of slip a distance of at least 10 inches above the floor of slip line.

A line drawn through these two points will indicate the correct inclination for keel blocking measured in a straight line, and if the bottom of keel does not extend below this line you can be sure that there will be ample clearance above slip during launching.

To insure that you understand this explanation I have drawn Fig. 2.



—Fig 2—

On this illustration I show a longitudinal outline of vessel. The line B.L. is drawn horizontal and only for the purpose of insuring that inclined lines are marked at correct inclinations to the horizontal.

The line S.S. indicates top of slip floor and is drawn at correct slip inclination.

The line W.W. indicates inclination of launching ways and is drawn at their proper inclination and height relative to line S.S.

The line S.K.F. indicates selected height and inclination of keel blocks, S being the location of stern, K the midship section position, and F the position of forefoot of vessel during construction. The line S.K.F. is continued past end of launching ways and if it nowhere falls below the line W.W. and the line W.W. is nowhere nearer to S.S. than 10 inches, the forefoot of vessel will clear end of building slip when vessel is launched. By measuring from S.S. to S.K.F. at proper intervals height of keel blocks to a straight line can be ascertained.

Keel Blocking

During construction the entire weight of a vessel is carried on a row of temporary building blocks placed immediately under keel at the proper inclination. These keel supporting blocks are generally placed about 4 feet apart, and each block is built of pieces of timber placed

one on top of another until the desired height is obtained. When the vessel is not exceedingly heavy, or the keel blocks not excessively high each keel block can consist of pieces of timber placed on top of each other, the lowest one being placed immediately on a cross cap of slip foundation; but when the vessel is heavy or keel blocks have to be erected to a height that would make it difficult to keep single blocking in position, cribbing is resorted to and each keel block is placed on the center of a crib of timber resting on at least two of the cross timbers of the slip foundation and built up of pieces of timber laid alternately lengthways and athwartships. The whole structure of each keel block must be securely fastened together, and as all of the keel-supporting blocking must be removed before vessel can be launched, the blocks or cribbing must be erected in such a manner that they can be removed from below the keel after the entire construction work is completed.

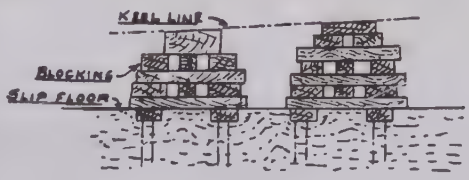
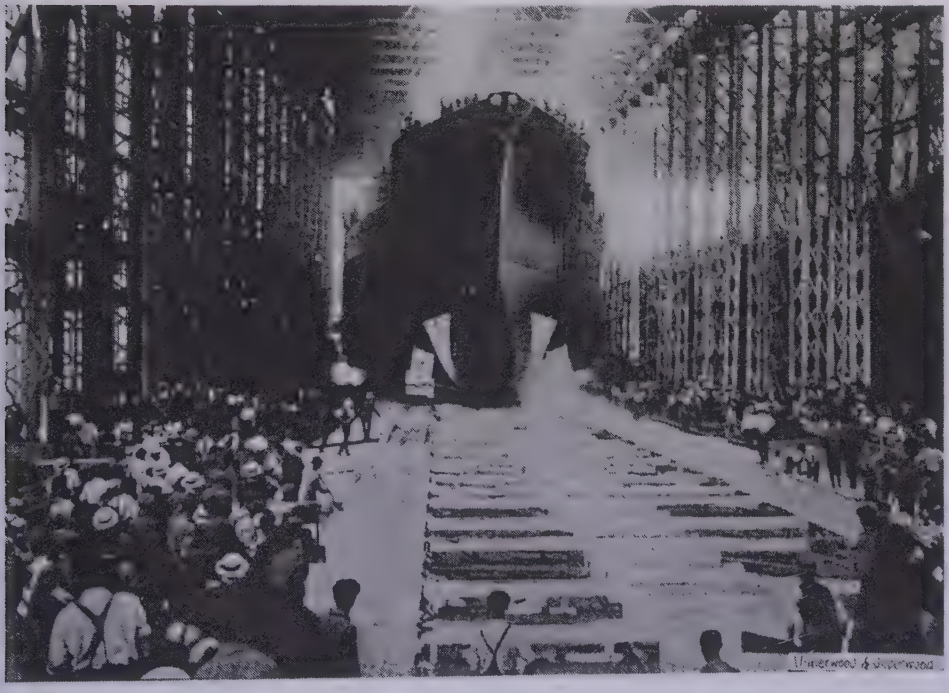


FIG 3

Fig. 3 shows illustration of keel blocking set up on a building slip, a portion of the blocking being cribbed.

(To be Continued)



Superdreadnought Idaho Being Launched at the New York Shipbuilding Yards at Camden, N. J. Idaho, the Latest Addition to the U. S. Fleet, Is a Sister Vessel to the Mississippi and New Mexico. She Is 600 Ft. Long, 97 Ft. 4½ In. Breadth, 30 Ft. Draught; Displaces 34,000 Tons; With Turbine Engines of 32,000 H.P. Is to Make 21 Knots, and Will Mount Twelve 14-In. and Twenty-two 5-In. Guns

Power Boats in Denmark

KING Christian X of Denmark is an enthusiastic power-boat man and his support has made power-boat racing very popular in his country. Just now in Europe on account of the war power boats are mostly used in the patrol service and to hear of racing in those waters is a pleasing change. King Christian drives his own boat and because of his interest "seilsport" is a social event. Races are held regularly off Jutland and in former years European boats have been the winners. This year, however, American engines and a boat built from an American design have won the honors

The races were held under the auspices of the Royal Danish Y. C. In Denmark a sporting event claims attention to the exclusion of all business occupations. Sailing, or power-boat racing, is sufficient to suspend commerce entirely, and at the events attended by society a Danish destroyer occupies a prominent position as a guard; assuring the safety of the King and an air of military distinction.

Tutto, the winner of the Danish regatta, is powered with a Sterling Model E 17-25 h.p. engine, and contended in this race against Rita, a cabin cruiser, driven by the King. The owner, Mr. Abrahamsen, is so enthusiastic over the performance of his American engine that he has ordered one of the big Model F, six-cylinder engines, made by the Sterling Engine Company. This engine will be installed in a 35-foot bottom racer now nearing completion, and which is being built after the famous Cinderella design of Messrs. Crouch.

The pictures show the happy owner being congratulated in company with a fair attendant. The owner of Tutto explains that the other racers are not shown because the Tutto was so fast that by the time the other contenders hove into view, there was nothing left of Tutto but her wake.

In this country the races for the Gold Challenge Cup in the Summer and the Miami races in the Winter always prove attractive. In Europe the Monaco races were popular before the war, but now the sport abroad has subsided temporarily with the exception of the few nations not involved in the big conflict. One reason hydro racing has not been very popular in Europe has been because of the high cost of fuel and the lack of an American-built engine to compete with the European machines. The success of the Tutto will do much to raise the estimation of Europeans in the ability of the American engine and when war is ended there should be a good market for such engines abroad.



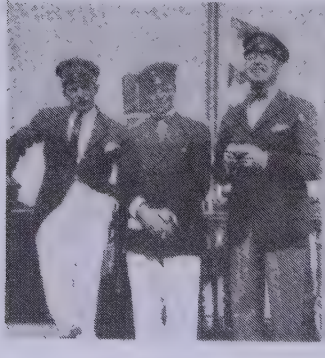
Tutto Leads the Fleet



Owner Abramson Happy



Rita in Wake of Tutto



Mr. Hein, Sterling Representative, Flanked by Danish Yachtsmen



King Christian (Back to Stern) Admires the Winner



Mrs. Hein and Count Yorsdorff at the Races

South Jersey Regattas

By J. Kinzer Shell, Jr.

THE opening of the power-boating season of the South Jersey Yacht Racing Association, when the first of the series of five race-meets was held on Saturday, July 7th, under the joint auspices of the Chelsea and the Atlantic City Y. Cs., over the course of the latter organization, was very successful. Reports had been in circulation for several weeks at Atlantic City that power-boat competition along the inland waterways of Southern New Jersey, due to the activities of the Navy Department in enrolling men and boats for patrol duty in the Naval Coast Defense Reserve, would be called off.

Twenty-five boats of the several types competed in the regatta, proving that yachting on the New Jersey Coast, from Bay Head to Cape May, is by no means on the wane. Thirteen of the competing boats made their initial appearance in this regatta. By their performances the new boats testify to the success of the regatta.

While the competition was of short duration in the matter of nautical miles traversed by the several types of racing boats, and the absence of several of the well-known racers of previous seasons somewhat marred the occasion, the racing was keen and of high quality. The new crop of boats set up a high standard, which will be hard to beat. Even though the races were held under the 1916 rules and regulations, due to the absence of proper data at the hands of the new measurer, Eli Townsend, of Stone Harbor, the boats, several of which were unable to be measured on account of an accident near the scene of the regatta, showed exceptional speed.

The express cruisers and the displacement racers displayed remarkable speed, when it is considered that the course was not of the best for fast competition. The exceptional speed was shown by the new displacement racer, H. Y. H., owned and piloted by H. Haws, of Atlantic City. The new racer covered the twelve nautical miles in 21 minutes 41 seconds, which means an average speed of 33.2 knots. She made the first lap of four nautical miles in 7 minutes 11 seconds, the second and third rounds, each in 7 minutes 15 seconds. Her time in the first round would give her a speed of 33.33 nautical or 38.5 statute miles per hour. The J. M. R., owned by James M. Rowland, of the Ocean City Y. C., like the Atlantic City speedster, not being measured, raced with a provisional rating, and she made exceptionally good time, doing the twelve nautical miles in 25 minutes 5 seconds. In the express cruiser class, the Mary Jane, owned by James M. Rowland, had an easy time with her competitors, covering the twelve nautical miles in 37 minutes 55 seconds.

The winners of the several classes are as follows:

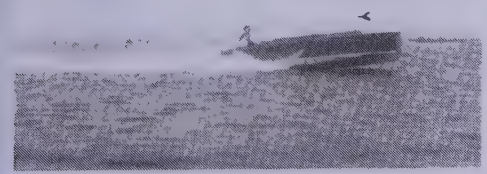
Cruisers, rating over 45: Laureba, H. D. Le Cato, Ocean City.
Cruisers, rating under 45: Margeth, J. N. Bower, Chelsea.
Express cruisers: Mary Jane, James M. Rowland, Ocean City.
Displacement racers: J. M. R., James M. Rowland, Ocean City.
Open boats, rating over 45: Winfield, F. P. Wall, Chelsea.
Open boats, rating under 45: Seamahr, F. C. Rollman, Chelsea.

The Ocean City and the Chelsea Y. Cs. divided the honors in winning, each club taking first honors in three races. The two classes of open boats and the lower class of cruisers went to the Chelsea Y. C., while the higher class of cruisers, the express cruisers and the displacement racer events, were won by the Ocean City representatives.

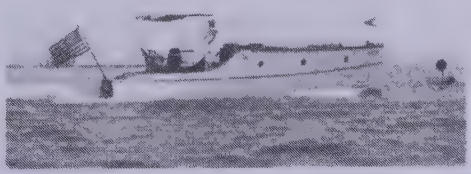
Even though the two clubs were tied for honors, the Chelsea Y. C. opened up a wide gap on the other clubs in the number of points scored for the trophy offered for the season's competition. The Chelsea representatives, besides the three wins, captured three seconds and three thirds, giving them twenty-seven points all told. The Ocean City club finished second with twelve points. The Atlantic City skippers gave the Ocean City power-boatists a hard battle for second honors, totaling eleven points, on two seconds and a third.

James M. Rowland, of Ocean City, received the distinction of being the only double winner with his speed boats, the displacement racer, J. M. R. and his express cruiser, Mary Jane. He saw Frank Nelms pilot the J. M. R. home to a win in the speedster class, and he brought the Mary Jane home an easy winner in the express cruiser event.

In the express cruiser contest, the Mary Jane was



J. M. R., J. M. Rowland, Owner, Ocean City Y. C., Passing the Home Buoy at Atlantic City



Laureba, H. D. Le Cato, Owner, Ocean City Y. C., First in Cruisers Rating Over 40 at Atlantic City

the last of three boats away, after two of the five boats had scratched. She conceded time allowances up to seven minutes and had very little trouble in overtaking the limit boat, the Maharba, owned by Von H. Herr, of the home organization. She caught the limit boat on the third lap and came home a winner by a wide margin of 7 minutes. The times by laps of the Mary Jane were: first, 8:50; second, 10 minutes; third, 10 minutes; fourth, 9.05. The times by rounds of the Maharba were: first, 13 minutes; second, 13 minutes; third, 13:05; fourth, 13 minutes.

The competition of the three racers in the speed class was spoiled somewhat by the breakdown of the Baby Nymph, owned and built for Louis H. Eisenlohr, of the Corinthians of Cape May. The Baby Nymph in her warming-up performance showed remarkable speed, although setting well down in the water in the stern and causing plenty of spray to fly. Even so, she was going over 30 knots an hour. She broke off part of her rudder in rounding a buoy and had to drop out of the competition.

The Laureba, formerly the Reba L., of Ocean City, had to compete twice in order to win the race for cruisers rating over 45. She easily trimmed the Peggy, owned by Commodore Samuel W. Whan, of Chelsea, and then



Lu-Lu, James Morris, Owner, One of Wilmington's Representatives in the 43-Mile Race

turned around and gave the Delphine, owned by A. Reed, of the home club, a trouncing. The Delphine, arriving late for the regatta, went around on time and won the event, with the owner of the Laureba, not knowing of her competing, thereby slowing down and making a race with the Peggy for the spectators. The Laureba easily outdistanced her rival in the race.

The summary follows:

CRUISERS, CLASS B. Rating under 45. Course, 6 Nautical Miles

Boat, Owner and Club	Rating	Allowance M. S.	Elapsed Time M. S.	Corrected Time M. S.
Margeth, J. N. Bower, Chelsea	40.86	1:35	30:26	28:51
Gertrude, G. N. Wilson, Chelsea	39.02	4:33	44:30	39:57
Bubble, G. L. Marland, Stone Harbor	39.60	3:59	47:11	43:12
Augusta, G. W. Shisler, Chelsea	44.46	Scratch.	Out.	

CRUISERS, CLASS A. Rating Over 45. Course, 8 Nautical Miles

Delphine, A. Reed, Atlantic City	46.26	19:07	48:40	29:33
Laureba, H. D. LeCato, Ocean City	47.88	9:32	56:13	46:41
Peggy, S. W. Whan, Chelsea	60.64	Scratch.	46:43	46:43

DISPLACEMENT RACERS. Course, 12 Nautical Miles

J. M. R., J. M. Rowland, Ocean City	65	12:49	25:05	12:16
H. Y. H., H. Haws, Atlantic City	79	Scratch.	21:41	21:41
M. S. R., G. L. Rodgers, Atlantic City	64.26	13.19	Failed to finish.	

OPEN BOATS, Over 35. Course, 12 Nautical Miles

Winfield, F. P. Wall, Chelsea	46.98	22:50	57:45	34:55
Foggy Dew, J. L. Appleton, Chelsea	51.96	13:59	49:34	35:35
Folome, E. A. Bookmeyer, Chelsea	73.00	Scratch.	45:40	45:40
Slick, J. F. McCall, Chelsea	61.38	7:52	Out.	
Sara Jain, M. R. Gano, Chelsea	67.00	3:47	Out.	

OPEN BOATS, Under 45. Course, 4 Nautical Miles

Seamahr, F. C. Rollman, Chelsea	43.02	Scratch.	22:04	22:04
Pet, G. C. Fleck, Chelsea	36.14	6:40	30:44	24:04
Osceola, H. Miller, Atlantic City	38.88	2:34	33:53	31:19
Dot, H. F. Morris, Chelsea	29.16	Engine trouble. Out.		

EXPRESS CRUISERS. Course, 12 Nautical Miles

Mary Jane, J. M. Rowland, Ocean City	86.38	Scratch.	37:55	37:55
Maharba, Von H. Herr, Atlantic City	70.54	7:55	52:05	44:10
Sarah Jane, W. C. Hondlan, Atlantic City	78.21	3:43	Broke down.	Out.
One-Thirty, L. D. Goodman, Chelsea	81.36	2:07	Out.	

CRUISERS, Rating Over 45. Distance, 6 Nautical Miles

Laureba, H. D. LeCato, Ocean City	47.88	Scratch.	27:21	27:21
Delphine, A. Reed, Atlantic City	46.26	1:09	35:05	33:56

ONE-DESIGN CLASS CATBOATS. Course, 6 Nautical Miles

Start, 1 P. M.

Boat and Owner	Finish H. M. S.	El. Time H. M. S.	Boat and Owner	Finish H. M. S.	El. Time H. M. S.
Fiddler, O. Crane	3:07:30	2:07:30	Blue Streak, J. White, Jr.	3:18:20	2:18:20
Suds, F. Sprow	3:07:45	2:07:45	Pollywog, Miss Mary White	3:18:50	2:18:50
Sea Maid, S. Parker	3:13:10	2:13:10	Scat, Caroline White	3:21:15	2:21:15
Alert, B. McNulty	3:13:15	2:13:15	Pet, Bertha White	3:27:55	2:27:55
Uncle Sam, F. T. McCortle	3:13:30	2:13:30			

Delaware River League

The Delaware River Yachtsmen's League opened its season's racing on Monday, July 2d, with one of the best cruiser races held on the Delaware River for some time. The race was the concluding feature of the three-days' outing of the United Boat Club of Wilmington, and while the entry list was not up to the standard the class of competition over the 43-mile course was sufficient to make the event interesting for the competitors. The contest was held under the 1916 rules and regulations of the A. P. B. A. and the cruisers were divided into classes, rating from 30 to 35, from 35 to 40, and from 40 and over. The race started from the Trenton Y. C. and had its conclusion at the anchorage of the Riverside Y. C., at Essington.

The Helma, owned by William Fredericks, of the United Boat Club of Wilmington, was the winner of the class rating over 40. The Mascot, owned and piloted by Commodore Charles Heiber, of the Columbia Y. C. and president of the D. R. Y. L., won in the class rating from 35 to 40. The Dora II, owned by Bruno Aireshoff, of the Riverside Y. C., was a winner in the class rating from 30 to 35.

The boats in the three divisions started according to their ratings. The Helma, showing a consistency of speed, covering the distance in a trifle less than five hours, was the first home of the fleet of nine boats, she starting in seventh position. The Helma made the fastest time of the entire fleet, and the Lady Jane, owned and sailed by Mrs. Jennie Sides, the only lady skipper on the Delaware River taking an active part in the racing game, captured third time honors. She was 13 minutes 38 seconds behind the Helma on actual running time. The Mascot made the second fastest time.

By capturing a first and a third, the Riverside Y. C., the baby organization of the League, took the lead in the point scoring, with a total of eight. The Lady Jane, which finished third in her class, moved up to first place on the point system. The Dora II was the other winner for the club at Essington. The Columbia Y. C. won second honors with four points, due to the success of the Mascot in the class rating from 35 to 40. The Farragut Sportsmen's Association finished third with three points, counting the second place winning of the Hattie Bert, in the low rated class of cruisers.

The summary of the cruiser race from Trenton to Essington follows:

CRUISERS, Rating 30 to 35

Boat, Owner and Club	Rating	Allowance H. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Dora II, B. Aireshoff, Riverside	30.67	31:07	5:58:32	5:27:25
Hattie Bert, H. Brightley, Farragut	30.67	31:07	6:16:15	5:45:08
Mazippa, L. Phillips, Columbia	33.71	Scratch.	Did not finish.	

CRUISERS, Rating 35 to 40

Mascot, C. Heiber, Columbia	39.56	Scratch.	5:11:16	5:11:16
Helen T., C. Townsend, Wissinoming	36.41	9:20	Did not start.	

CRUISERS, Rating 40 and Over

Helma, W. Fredericks, United	45.31	27:46	4:58:24	4:30:38
Alhambra, C. A. Church, United	43.65	36:27	5:13:25	4:36:58
Lady Jane, J. Sides, Riverside	45.59	26:12	5:12:02	4:45:50
Lu Lu, J. H. Morris, United	51.28	Scratch.	4:48:00	*4:48:00

*Cut course, disqualified.



Mascot, Charles Heiber, Owner, Winner of the Trenton-Essington Race, 35 to 40-Foot Class

The Camden Y. C. won leading honors over the representatives of the Farragut Sportsmen's Association, in the second race-meet of the Delaware River Yachtsmen's League, held on Saturday, July 14th. The Camden Y. C. scored fourteen points, three more than the Farragut organization. The Wissinoming Y. C. finished with six points, while the Columbia Y. C. captured five points. The winners of the six races were:

Open boats. Rose, H. Macht, Wissinoming Y. C.

Glass cabins, rating under 35. Lillian II, E. J. Crosby, Camden Y. C.

Glass cabins, rating over 35. Hannah II, William Schroeder, Farragut.

Cruisers, rating 25 to 35. Hattie Bert, H. Brightley, Farragut S. A.

Cruisers, rating 35 to 40. Mascot, Charles Heiber, Columbia Y. C.

Cruisers, rating 40 and over. Deceiver, C. P. Bond, Camden Y. C.

The Deceiver, winner of the higher class of cruisers, had no trouble in defeating the Wanderer, piloted by Commodore Louis A. Fredericks, Jr., of the Wissinoming Y. C. The Deceiver covered the 13½-nautical-mile course, from the Camden Y. C., thrice around Pettys Island, and finish at Farragut Sportsmen's Association, in 1 hour 42 minutes and 25 seconds. The Mascot, owned by President Charles Heiber of the League, won a hollow victory in the cruiser division rating from 35 to 40. She had as her competitor the Helen T. of the Wissinoming Y. C., but the latter after getting under way developed engine trouble and retired from the contest.

The Hattie Bert, owned by Harry Brightley of the Farragut organization, won in the lower class of cruiser competition from the Reba B. II, owned by H. G.



Helma, Fred'k William Frederick, Owner, Finishing First in the Trenton-Essington Race of 43 Miles



Margoth, J. N. Bower, Owner, Chelsea Y. C., First in Cruisers Race of South Jersey Y. R. A.

Knowles of the Camden Y. C. The Rose, owned by H. Macht of the Wissinoming Club, won the open boat race with comparative ease, her only competitor, the Junior, being 31 minutes behind her on corrected time. She was 45 minutes behind the Rose on elapsed time.

The Lillian II, owned by E. J. Crosby of the Camden Y. C., walked away with the glass cabin division by over 5 minutes from the Mildred II, owned by Schneider and Meidt of the Farragut organization.

The summary of the races follows:

OPEN BOATS CLASS, Rating Under 40. Course, 9 Nautical Miles

Boat, Owner and Club	Rating	Allow. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Rose, H. Macht, Wissinoming	38.10	Scratch.	1:27:17	1:27:17
Junior, F. Deebold, Farragut	30.38	14:51	2:12:56	1:58:05

GLASS CABINS, Rating Under 35. Course, 9 Nautical Miles

Lillian II, E. Crosby, Camden	32.70	3:01	1:37:32	1:34:31
Mildred II, Schneider, Farragut	33.41	1:37	1:41:16	1:39:39
Loretta, Lane, Wissinoming	29.57	10:13	1:55:09	1:44:56
Katie II, C. E. Cau, Camden	34.15	Scratch.	1:50:13	1:50:13

GLASS CABINS, Rating Over 35. Course, 9 Nautical Miles

Hannah II, H. W. Schroeder, Farragut	39.15	4:05	1:28:18	1:24:13
Margaret, C. G. Oliver, Farragut	42.18	Scratch.	1:36:30	1:36:30

CRUISERS, Rating 25 to 35. Course, 13½ Nautical Miles

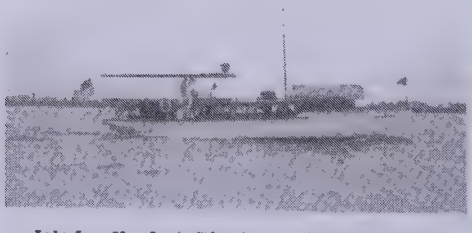
Hattie Bert, H. Brightley, Farragut	30.66	10:57	2:08:07	1:57:10
Reba B. II, H. Knowles, Camden	29.49	15:55	2:19:24	2:03:29
Mazeppa, L. Phillips, Columbia	33.71	Scratch.	2:09:55	2:09:55
Minnie B., C. Donovan, Camden	32.03	3:25	2:32:39	2:29:14
Plover, F. Perkins, Camden	33.22	2:22	Failed to finish.	
Dora II, B. Aireshoff, Riverside	30.67	10:57	Out.	

CRUISERS, Rating 35 to 40. Course, 13½ Nautical Miles

Mascot, C. Heiber, Columbia	39.56	Scratch.	1:52:10	1:52:10
Helen T., C. Townsend, Wissinoming	36.41	7:37	Broke down.	

CRUISERS, Rating Over 40. Course, 13½ Nautical Miles

Deceiver, C. P. Bond, Camden	44.13	12:02	1:42:25	1:30:23
Wanderer, L. Fredericks, Wissinoming	40.53	19:42	1:59:39	1:39:57
Alhambra, C. A. Church, United	42.17	15:54	Out.	
Helma, W. Fredericks, United	45.31	9:36	Out.	
Lady Jane II, Mrs. J. Sides, Riverside	45.59	9:13	Out.	
Lu Lu, J. H. Morris, United	51.28	Scratch.	Out.	



Lady Jane, Mrs. Jennie Sides, Owner, a Consistent Performer on the Delaware



Alhambra, Charles Church, Owner, Finishing Second in the Trenton-Essington Race

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART VIII

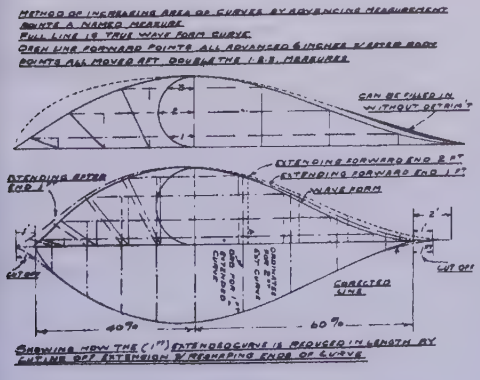
THE contention of advocates of this form of water-line is that water-lines formed in this manner offer least possible resistance to propulsion, and while this may be true when shape alone is considered, it is not entirely true when every element of a design is considered as a unit. Resistance to propulsion, seaworthiness, stability, capacity, have all to be considered when designing a boat and the designer should always consider these as a unit without unduly magnifying the importance of any one feature or part.

The extreme forward ends of water-lines laid out in the manner explained will sometimes be so fine that it would be impossible to obtain the requisite strength of construction at stem. To overcome this a slight modification of the rule is often necessary. This modification is made in the following manner:

The bow portion of the base line is drawn longer than it is intended that the bow of water-line shall be and after the water-line is marked out, as already explained, the surplus length is marked off at extreme forward end and forward end of the water-line curve remarked to terminate at the proper point. The requisite length is thus obtained and the extreme fineness at bow is done away with without materially altering the shape.

I have explained this method of shaping water-lines because it is a scientific method of acknowledged merit.

Displacement should always be considered when shaping water-lines. If a boat is to have a comparatively large displacement it is not advisable to shape water-lines in exact accordance with the wave-line theory because the capacity of a boat having wave lines is not so great as when the water-lines are convex, or parabolic.



SHOWING HOW THE (1ST) EXTENDED CURVE IS REDUCED IN LENGTH BY CUTTING OFF EXTENSION & REDRAWING END OF CURVE

Fig. 35

In other words on the same water-line length, area of midship section and L.W.L. plane, the displacement of a wave form L.W.L. boat will be less than that of a boat having convex water-lines.

An advantage of the wave-line form that should not be overlooked is the capacity, and weights are carried in a better position, nearer the middle of the boat, which is of great importance.

In the parabolic convex form the center of weight will lie about 0.37 from the middle; in the straight-line form this center is at 0 35 and in the wave form at 0.29 from the middle.

Fig. 34 shows trial wave-form curves laid out. (See July issue.)

Fig. 35 shows methods used for correcting a wave-form curve.

4th Preliminary Calculation. Preliminary Stability Calculation.—Having marked out the proposed shape of L.W.L. it is advisable to ascertain whether a boat having the selected dimensions, shape, and area of L.W.L. plane, will be stable. This calculation is made in this manner:

1st.—The proposed L.W.L. plane is divided into a sufficient number of intervals for a Simpson's rule calculation and the area and location of the C.G. point of plane is determined.

2d.—The M.I. of the L.W.L. plane around a longitudinal axis drawn through its center is calculated.

3d.—The approximate vertical position of the C.B point is ascertained by making this calculation.

$$\frac{1}{3}\left(\frac{d}{2}+\frac{V}{A}\right) = \text{Distance C.B. point is likely to be below the L.W.L.}$$

d—Standing for draught at midship section.
V—Standing for volume of displacement in cubic feet.
A—Standing for area of L.W.L. plane in square feet.

4th.—Find the probable location of the C.G. of weights vertically by making this short calculation.

In boats having no inside ballast the vertical position of C.G. of weights will be found to be located at a point that is (approximately) *one-half* of the depth of midship section above *rabbet*.

The depth of midship section being measured from rabbet to sheer amidships.*

For a certain design the measured depth of midship section from rabbet is 3.33 feet. Therefore, the C.G. of gravity of weights is located at a point that is (approximately) 1.66 foot above rabbet.

Knowing the draught of water amidships (it is 1.25

*This rule for measuring cannot be applied to boats having raised cabins, cabinhouses, or tops that extend above the sheer. In such cases some addition must be made to the depth measure to cover the leverage of the additional height.

foot) from L.W.L. to rabbet, the distance that the C.G. point is away from L.W.L. can be ascertained by subtracting the draught of water from the half-depth measure. In this case the calculation is:

1.66 — 1.25 = 0.41 foot. Distance the C.G. is *above* the L.W.L.*

Moment of Inertia Explained

The *moment* of any physical agency is the product of force and distance of the point of application from the fulcrum, the distance being the least distance between the center of force applied and center of the fulcrum, or axis.

Inertia is a measure of *massiveness*, or mass, and is a term expressive of that indifference to a state of rest, or motion, which is the universal property of matter and may be expressed by saying that a body in motion will continue in motion, and a body at rest will remain at rest unless acted upon by some external force.

The sum of the force required to overcome the *inertia* of a body, whether to stop or to move it, is called the *moment of inertia*.

Moment of inertia deals with the rotation of bodies around an axis. The axis can be either within or without the body and it is of great importance to keep the location of the axis in mind when calculating the moment of inertia of any body, because it naturally stands to reason that the further the *mass* is away from the axis around which it is supposed to revolve the greater the force necessary to stop the momentum, or to start the mass revolving if it is stationary.

The *moment of inertia* of any area can be ascertained by dividing the area into a large number of equal sized smaller areas and multiplying each small area by the *square* of the distance its C.G. point is from the axis around which the whole area is supposed to revolve. The sum of all these will be the moment of inertia of the whole area around the named axis. To explain this more fully I have drawn Fig. 36.

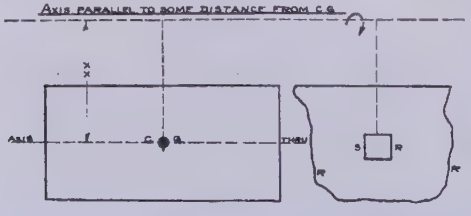


Fig. 37 Fig. 36

Fig. 36 shows an irregular-shaped area and above it (— — — —) is marked the axis around which it is to revolve.

Let us suppose that the area enclosed by the R.R. line is divided into equal sized small areas, like S.R., and the distances their C.G. points are from the named axis is measured. Then the sum of all such products as S.R. multiplied by the square of distance the C.G. is from named axis will be the moment of inertia of *whole area* around the named axis.

*This coincides very nearly with actual location found by making the detailed calculation.

It is usual and proper to use the letters M.I or the single letter I, in place of the words moment of inertia and I will, hereafter, use these letters to indicate, or express, moment of inertia.

If the *area* of a figure is known, the M.I. around an axis *within* the figure can be found by using this formula:

Co × Area × Depth squared = M.I.

Co being a coefficient varying with shape of figure and position of axis.

Area being the area of the whole figure.

Depth squared being the depth, measured perpendicular to axis and squared.

The following are coefficients to use for regular shaped figures.

Table of Coefficients to Use When Axis Is Through C.G. of Figure

For a circle Co = 1-16 or M.I. = 1-16 × A × F squared.
For a rectangle Co = 1-12 or M.I. = 1-12 × A × F squared.
For a triangle Co = 1-18 or M.I. = 1-18 × A × F squared.

These coefficients can only be used when the axis lies *within* the figure.

When the axis around which the figure, or mass, revolves is parallel to and a given distance from an axis drawn through C.G. of figure the M.I. of known areas is determined by first calculating the M.I. of the figure around an axis drawn through its C.G. parallel with the axis around which the figure revolves, and then adding to the M.I. figures the product of the area into the *square* of the distance between the two axes. (See Fig. 37.)

From this you can readily see that:

1st.—The M.I. of a figure about an axis through its own C.G. must always be *less* than about an axis parallel to it and some distance away.

2d.—If an area is distributed away from its C.G. the M.I. is very much greater than if it is massed near to the C.G.

In boat and vessel calculations the M.I. is almost always calculated around an axis within the figure.

Now refer to the Fig. 38 illustration and the calculations I have made to determine its M.I. relative to the fore-and-aft axis marked, which you will note passes through the C.G. of the figure.

The figure being a rectangle its area can be determined and then the M.I. can be calculated by using the formula and coefficient multiplier for a rectangle.

The calculation works as follows:
Area = 9 × 6 = 54 square feet.
Perpendicular depth is 6 feet. $6^2 = 36$.
Coefficient for rectangle is 1-12.
Therefore:

$$\frac{54 \times 36}{12} = 162$$

The M.I. of E. around the marked axis is, therefore, 162.

Rule for Calculating M.I. of a Boat's Water Plane Around a Longitudinal Axis Drawn Through Its C.G.

Divide the longitudinal axis into a number of equal intervals suitable for the application of one of Simpson's rules. Mark ordinate lines at points of division, number

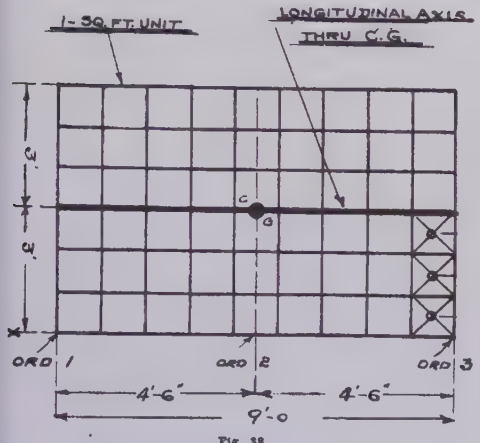


Fig. 38

them and measure their lengths from the longitudinal axis out.*

Next *cube* each measurement and enter the cubes of measurements as ordinate lengths for the rule. Put the cubed ordinate lengths through Simpson's multipliers in the ordinary way and total the function of cubes. The sum of the function of cubed lengths is then treated in this way: One-third of the total multiplied by the proper interval multiplier (⅓ or ⅜ common interval) will give M.I. of *one-half* the plane. By multiplying this total by 2 the M.I. of the whole plane is ascertained.

CALCULATION TO FIND M.I. OF FIG. 38 AROUND ITS LONGITUDINAL AXIS

Ord. Number	Length of Half-Ord.	Cube of Half-Ord.	S M	Function of Cubes
1	3.00	27.00	1	27.00
2	3.00	27.00	4	108.00
3	3.00	27.00	1	27.00
				162.00

One-third total is = 54.00
One-third interval = 1.5

81.00 M.I. of one-half plane.
Multiplier 2

162.00 M.I. for whole plane.

I will now make a complete calculation to determine the M.I. of Fig. 39 water plane around its longitudinal axis drawn through C.G. of plane.

*A longitudinal axis drawn through C.G. of a water plane will run from stem to stern through center of plane, and as both sides of plane are alike *one-half* of plane is each side of line, or axis. When calculating M.I. of a water plane around a longitudinal axis through C.G. all measurements *must* be made from *axis* out, and not from outside to outside of plane. Thus one-half of plane is measured and to ascertain the M.I. of whole plane the multiplier 2 is used. If the whole width of plane measurements were used the final figures would indicate the M.I. of plane around a longitudinal axis drawn along *one* side of plane. *It is important to keep this in mind.*

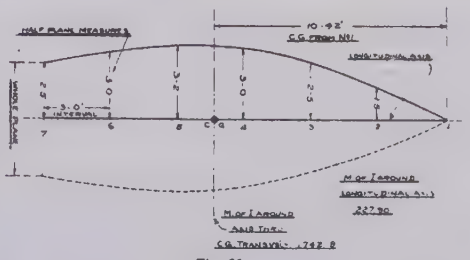


Fig. 39

CALCULATION TO DETERMINE THE M.I. OF THE L.W.L. PLANE OF A BOAT AROUND A LONGITUDINAL AXIS DRAWN THROUGH ITS CENTER.

PARTICULARS.—The length of plane is 18 ft., therefore, it can be divided into six intervals (for seven ordinates) and Simpson's first rule can be used. Interval between ordinates is 3 ft. Lengths of ordinates, from center line out, are as entered below:

Ord. Number	Length of Half-Ord.	Cube of Length	S.M.	Function of Cubes of Length
1	0.00	0.00	1	0.00
2	1.50	3.37	4	13.48
3	2.50	15.62	2	31.24
4	3.00	27.00	4	108.00
5	3.20	32.76	2	65.52
6	3.00	27.00	4	108.00
7	2.50	15.62	1	15.62
		Total		341.86

One-third of total is used. It is. 113.95
One-third interval multiplier is. 1

M.I. of one-half the plane is. 113.95
Multiplier for whole plane. 2

M.I. of the whole plane around a longitudinal axis. 227.90

When the area of plane is not known, or is known approximately as when making preliminary calculations for a design, the M.I. of the plane around its longitudinal axis can be very closely calculated by using this formula:

$$Co \times L \times B^3 = M.I.$$

Where Co is a coefficient varying with each change of shape.

L is length of the plane.

B^3 is breadth, extreme, (from outside to outside of plane) cubed.

For a L.W.L. plane in the form of a rectangle the Co is 0.083.

For a L.W.L. plane in the form of two triangles the Co is 0.02.

Therefore the coefficients for ordinary shaped water planes of boats must lie between the above figures.

Using this formula the M.I. of Fig. 38 works out as follows:

$$.083 \times 9 \times 6^3 = 161.35 \text{ M.I.}$$

This is very near to the figures obtained by calculating the M.I. in the manner explained.

For the water plane whose M.I. is calculated above the formula gives:

$$0.048 \times 18 \times 6.4 \text{ cubed} = 226.492.$$

The coefficient for the L.W.L. whose moment of inertia I calculated is 0.048.

While it is always necessary to make complete cal-

culation in the manner shown, a knowledge of the proper coefficients to use will enable you to quickly determine, during the preliminary stages of work, the moment of inertia of intended L.W.L. plane.

For this reason the designer should make it a practice to determine the M.I. coefficient for every design and for every shape of L.W.L. plane. If this data is properly tabulated the designer will always have the data in convenient form for reference.

Below I give headings for tabulated data of this kind.

M.I. of L.W.L. Plane Data and Particulars

Length of L.W.L.	Breadth of L.W.L.	Area of Plane	L.W.L. Coeff. of Fineness	M.I. Around Long Axis	M.I. Coeff.
18.0 ft.	6.4 ft.	87.9	0.76	227.9	0.048

Knowing the M.I. of a boat's L.W.L. plane around a longitudinal axis drawn through its center, the displacement in cubic feet, and location of C.B. point above the bottom of boat, the distance the *transverse* M.C. point is above the C.B. point can be quickly located by making the following short calculation:

$$\frac{\text{M.I. of the L.W.L. plane}}{\text{Displacement in cubic feet}} = \text{Height of M.C. (transverse) above C.B.}$$

A knowledge of this is valuable because it indicates the approximate initial stability.

The above formula will give figures that will indicate whether, or not, the boat is stable when upright.

The amount of stability a boat possesses depends upon:

1st.—Her underwater shape.

2d.—The distribution of this shape, or bulk.

3d.—The distribution of weight of boat and all on board.

If the vertical position of the center of a boat's underwater bulk is known we have an accurate knowledge of the distribution of *bulk* vertically, and if we also know the M.I. of the boat's immersed plane of greatest width and area we have a correct measure of the *inertia* of the mass immersed, because inertia varies with distance that the mass is distributed away from the axis of rotation, or axis around which the mass is supposed to revolve, and the plane of greatest width and area indicates the greatest transverse distance that the *mass* can be away from the axis.

Therefore by using the M.I. and mass figures in a proper manner the amount of force necessary to start boat revolving (inclining) around an axis drawn through C.G. longitudinally can be ascertained. This force expressed in pounds, or tons, will indicate the ***moment*** of force required to incline the boat to a named angle, or the figures can be used to indicate a measure of comparison between the boat's actual stability and that of the boat when in a state of neutral equilibrium.

Shape is permanent, therefore, whatever "*shape* stability" a boat possesses is fixed for each draught of water and inclination.

Weight stability, or stability due to distribution of weight, is a quantity varying with each change of weight and location of the C.G. point.

You already know that for every body there is a point below which the C.G. of the body must be kept if it is desired to have the body rest in a state of stable equilibrium. In a boat this point is termed the M.C. point and its position depends upon shape and distribution of underwater bulk. Knowing the *bulk* immersed and its distribution it is possible to locate the M.C. point, and knowing the location of the M.C. point we can learn whether the boat is stable or not by locating the C.G. point and noting whether it is *below* the M.C., and the distance that the C.G. point is below the M.C. gives some indication of the amount of initial stability possessed by the boat.

(To be Continued)



Junco. C. K. Benedict, Cedarville, Mich., Owner; Length 30 Ft. 6 In., Breadth 9 Ft. 6 In., Draught 2 Ft. 6 In.; Built by Racine Boat Company; Driven by a 4-Cyl. 5-In. x 6-In. Peerless Engine

Designs

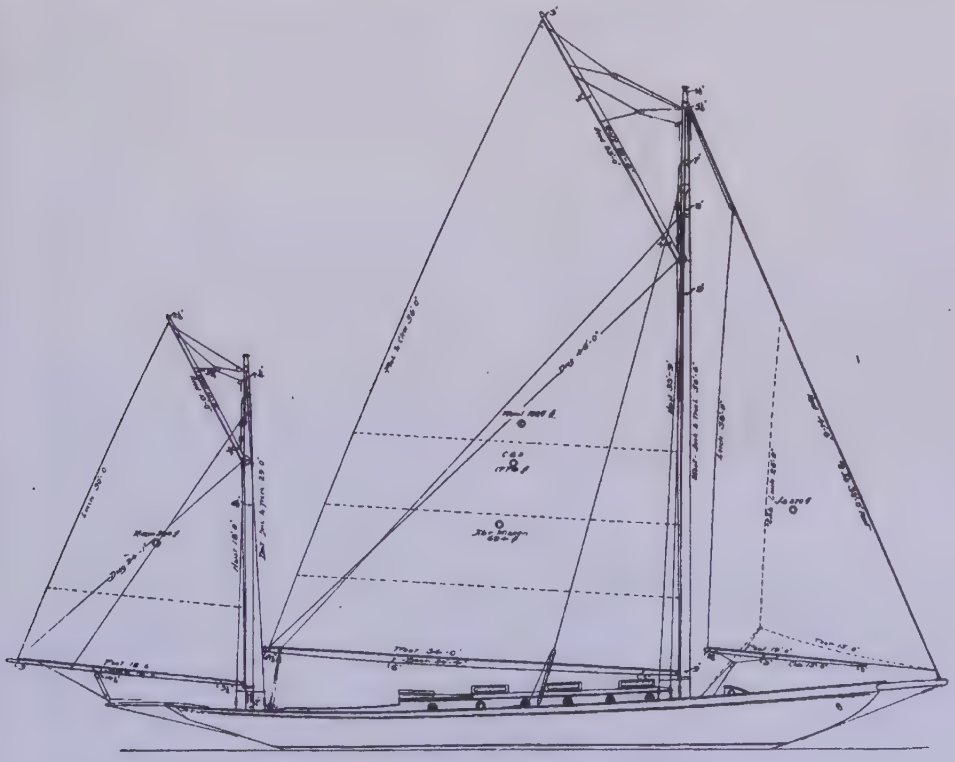
44-Foot W. L. Auxiliary Yawl

The accompanying plans of the 44-foot water-line yawl, Tipperary, were drawn by Bowes & Mower and the boat built by the Burger Boat Company of Manitowoc, Wis., for E. N. Murphy, of Green Bay. The boat will be used on the Great Lakes and the overhangs have been kept moderate, and the rig is well balanced and sufficiently large to be comfortable for average weather conditions. A four-cylinder Model F Sterling is installed for calm weather and is sufficient to drive her along at a good clip. The draught has been limited so that it will not be necessary to keep so far offshore, while a centerboard is housed in the keel to enable her to really work out to windward.

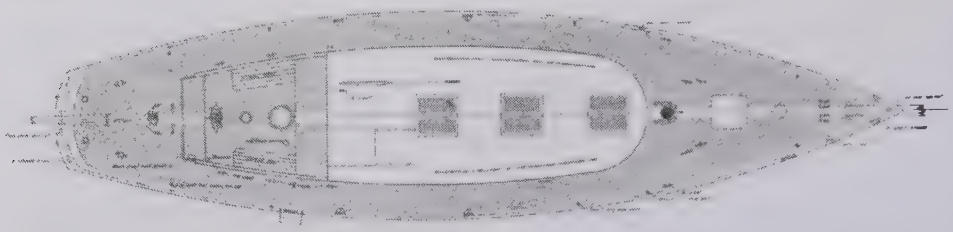
The arrangement on deck follows the conventional type, with a low trunk cabin, kept narrow enough to give a good deck all along the side and carried across the after end of the house forming a bridge deck. The cockpit is sunken, with a seat on each side under which are the gasolene tanks. The arrangement below is very well worked out to give the maximum amount of room and comfort without being divided into too many separate compartments.

The engine is placed as far aft as possible and is partly under the bridge deck, with a locker over that part which extends into the main cabin, the upper part of which is utilized as a wine locker while the lower is removable, giving access to the flywheel, etc. The companionway is on the starboard side and there is a large locker on each side partly under the bridge deck, that on the starboard side being used for oilskins and the one on the port side for general use.

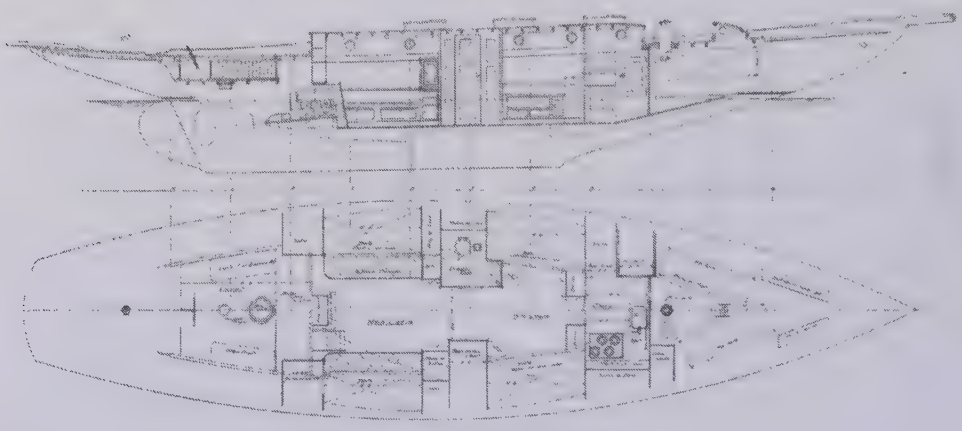
In the main cabin are two 6-foot 6-inch berths with seats in front, the one on the port side being an exten-



Sail Plan of 44-Foot L. W. L. Auxiliary Yawl Tipperary, Designed by Bowes & Mower



Deck Plan of 44-Foot Auxiliary Yawl Tipperary



Arrangement Plans of Auxiliary Yawl Tipperary

sion transom for an extra guest. At the forward end there is a locker on each side with a large clothes locker on the starboard side and the toilet room to port, separating the main cabin from the stateroom. Two 6-foot 6-inch berths, with drawers and locker under, two small hinged seats at the after end and two bureaus forward, comprise the outfit in the stateroom.

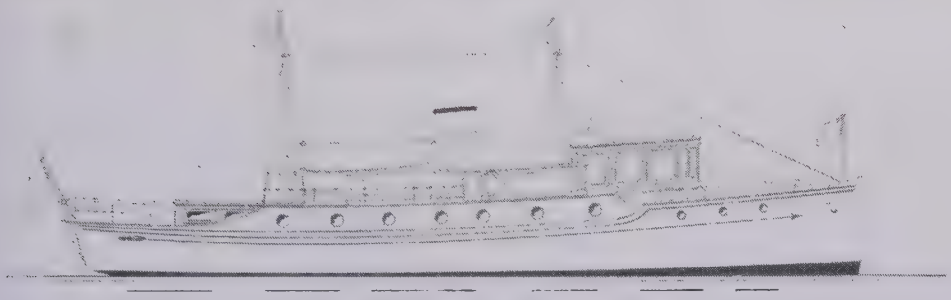
The galley extends across the ship, just aft of the mainmast and between it and the stateroom. In it is a four-burner stove, sink, ice-chest, dresser and shelves. The forecastle has two pipe berths, a clothes locker, crew's toilet, shelves, etc. Taken all in all, it is a very attractive yacht and has created favorable comment in her home waters and reflects credit to her designers.

60-Foot Cruiser Onawa

The plans of the 60-footer Onawa, shown herewith, are from the board of Edson B. Schock and are typical of the boats developed on the West Coast. This boat is owned by C. M. Poncin, of the Seattle Y. C., and is driven with a 40-h.p. Frisco Standard engine. The fuel capacity is large and is sufficient to enable the Onawa to make the run from Seattle to Southeastern Alaska and return.

To increase the room below decks the sides are carried up amidships to a fair distance above the sheer, with the deck flush across. The forward deck is lower than that amidships, the break coming near the after end of the pilothouse. The floor of the latter is sunken so that it can be kept low and not make the boat top-heavy in a seaway. Aft the midship deck is carried out over a narrow trunk, giving headroom in the after stateroom. The after deck is fair with the main sheer line.

There is a large fuel tank in the lazarette, forward of which is a double stateroom with a berth on the port side and wide seat to starboard, with bureau between at the after end. At the forward end on each side is a full-length hanging space, and over the berth and seat a shelf is worked up under the deck. Just forward of this is the main cabin, 12 feet 6 inches long, the full width of the boat, with the entrance on the starboard side aft. A long seat is worked along the port side and carries across the after end to the door to the stateroom. There is also a shorter seat on the starboard side, with a gun rack at the forward end and a buffet opposite it. The sideboard is in the center at the forward end and the table on the port side aft. Lockers and alcoves are worked on each side over the seats. There is a toilet opening off the main cabin on the port side and the galley, occupying the same space fore-'n'-aft, 4 feet 5 inches, is to starboard.



80-Foot Cruiser Onawa, Owned by C. M. Poncin

The engine room is large, 9 feet 6 inches, with full headroom throughout. Two additional fuel tanks are installed at the after end with a gravity feed tank amidships, hung on the after bulkhead. There are also two large lockers, a seat and a work-bench in this space, and there is an entrance from the pilothouse.

The space under the pilothouse is utilized for extra tanks, there being the main water tank in the center, a gasolene tank on the port side and the lubricating oil tank to starboard. Forward there is another stateroom, with a single berth with a shelf over it, a seat, lockers, hanging space and bureau, with a desk at the forward end, with seat opposite with locker and shelf in back of the latter. Forward is the chain locker.

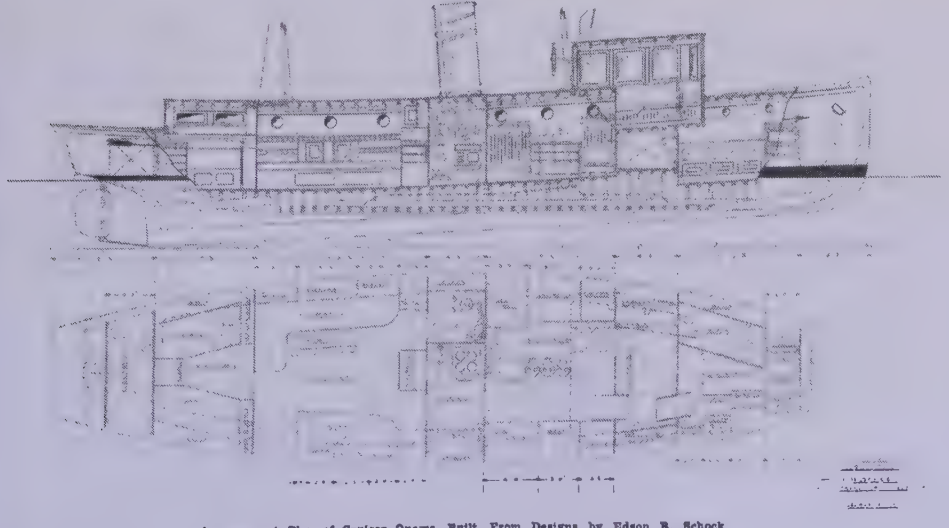
The principal dimensions are:

Length o. a.	60	feet	0 inches
Length w. l.	56	"	0 "
Breadth	14	"	0 "
Draught	4	"	9 "

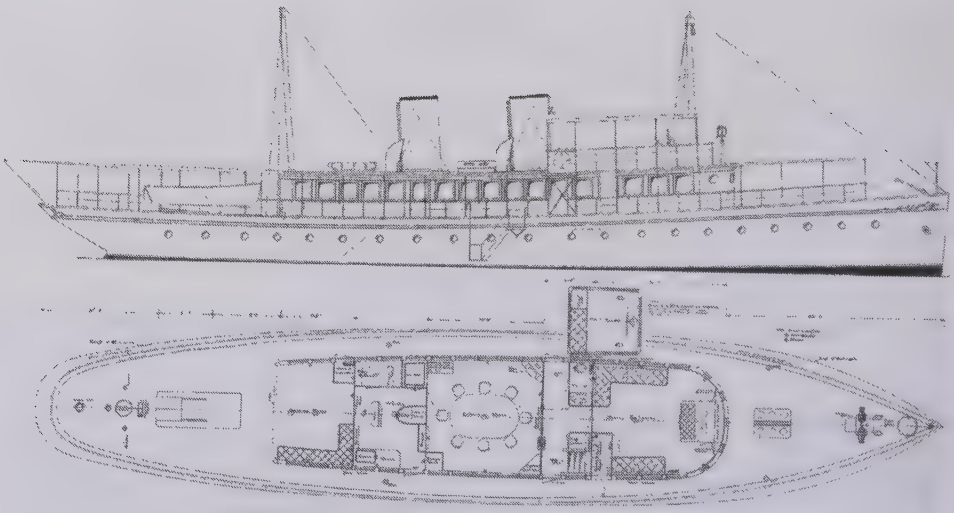
110-Foot Cruiser Consuelo

J. Percy Bertram, of the New York Y. C., commissioned J. Murray Watts to design for him a 110-foot seagoing vessel. The result is the Consuelo, which has been built by the George Lawley & Son Corporation at Neponset, Mass. This boat shows the general tendency of the large power yacht to get the accommodations of a houseboat with the seaworthiness and shippy appearance of a seagoing vessel.

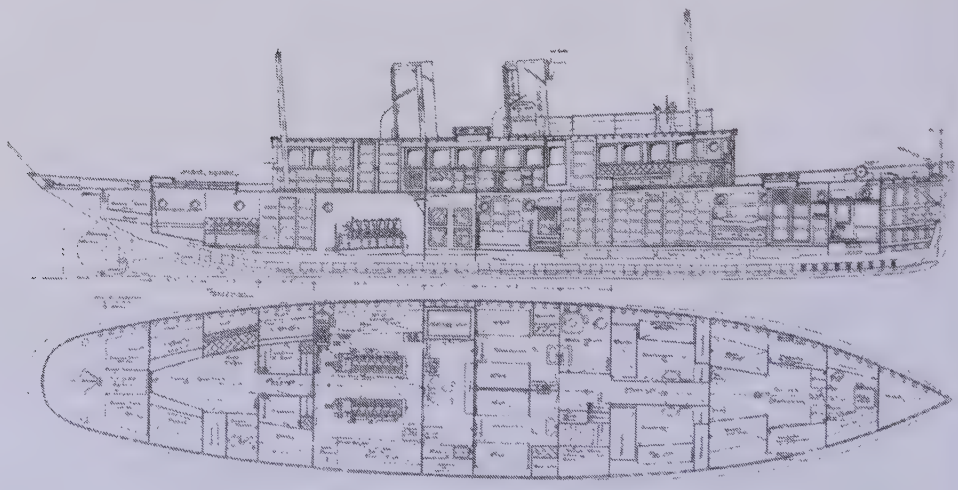
The feature of the boat is the unusually large and roomy deckhouse, on top of which is the bridge deck and steering position. For winter cruising a small pilothouse will be fitted to enclose the steering position, but in Summer it will use the open bridge deck. The deckhouse has the main saloon in the forward end, 16 feet by 14 feet. There are no doors leading directly out from this saloon, but there is a door from the lobby which opens on to the main deck from either side. The advantage of this is to keep the rain and damp out of the



Arrangement Plan of Cruiser Onawa, Built From Designs by Edson B. Schock



Consuelo, 110-Foot Cruising Yacht, Owned by J. Percy Bertram, N. Y. Y. C.



Arrangement Plan of 110-Foot Cruiser Consuelo, Built by Lawley, From Designs by J. Murray Watts

main saloon and out of the dining room, which comes aft of the lobby. The dining room is 14 feet square, and has two recessed buffets at the after end, and a serving table, corner cupboards and open fireplace as shown. Next to the dining room is a large pantry 8 feet 9 inches by 14 feet, with storeroom, ice-box, sink and lockers, etc. The compartment at the after end of the deckhouse is a smoking room, open at the after end in Summer and arranged that it can be enclosed in Winter.

The arrangement below dock shows five large staterooms, each fitted with two beds, a bureau, wardrobe, transom and wash-basin. There are also two bathrooms and a passage connecting the forward stateroom with the main staircase leading up to the lobby. Back of the staircase is a large room for trunks and baggage storage. The galley is below decks. The engine room is aft of the galley. In it are installed two 160-h.p. Speedway engines, a 4-k.w. electric plant, the auxiliary plant, tanks holding 2,200 gallons of fuel and 100 gallons of lubricating oil. The crew's quarters are unusually spacious, there being bunks for five men, and a messroom, and two staterooms, one for the captain and one for the mate and engineer. Besides the large fuel supply on this vessel there are tanks for 1,700 gallons of water, and a gravity system supplied by electric pumps for the owner's bath and plumbing.

The material and finish on this vessel are the finest procurable. The deckhouse and deck joinerwork are of paneled Honduras mahogany, the owner's quarters below being finished in cream-colored paneling, trimmed with mahogany.

The general dimensions are:

Length o. a.	110 feet 0 inches
Length w. l.	102 " 0 "
Breadth	21 " 0 "
Draught	5 " 8 "

75-Foot Cruiser

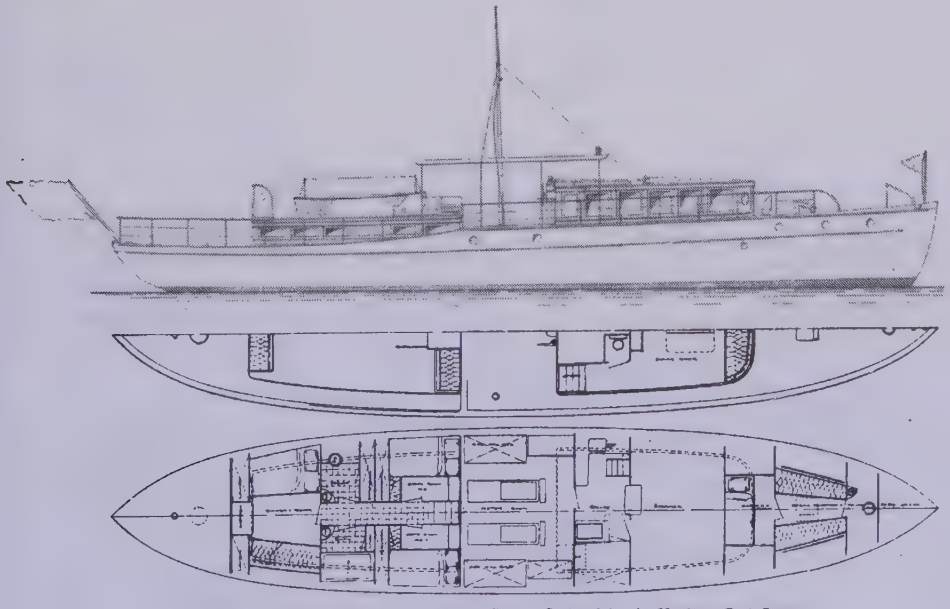
A heavy-duty type of cruiser, built for hard service and intended for extensive cruising, has been designed by the Matthews Boat Company, who have furnished the plans. The quarters below are very comfortable, consisting of owner's stateroom aft with double and single berth, bathroom, toilet room, and two double staterooms forward.

The engine room amidships provides for two heavy-duty engines of about 75 h.p. each, to give a cruising speed of about 11 miles per hour. The galley is forward of engine room and has separate entrance steps to the raised dining saloon forward. A separate berth is provided for the captain partly underneath the seat at the forward end of the dining saloon and partly under the forward deck. Quarters for crew are forward.

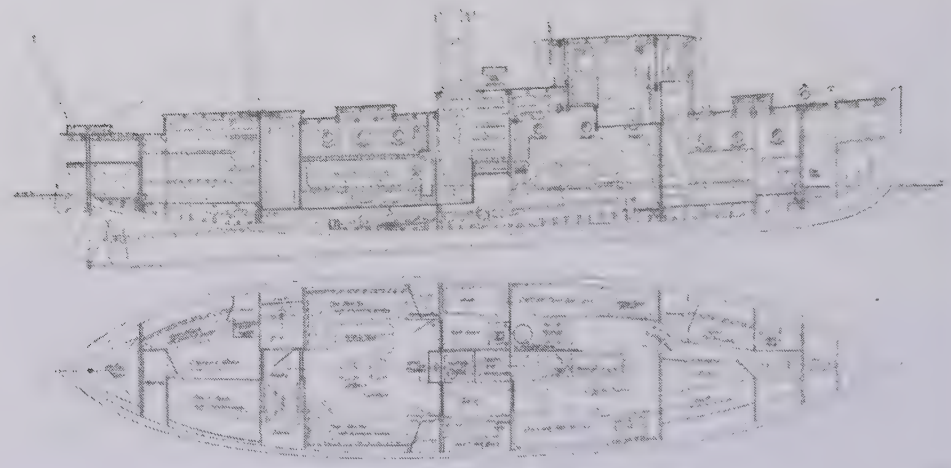
Liberal breadth and good freeboard, together with deep draught, make this boat a very desirable seaworthy type. The deckhouses and decks are entirely finished in teak. The interior of the dining saloon is in mahogany. The owner's quarters aft are in cream enamel with mahogany trim.

The general dimensions are:

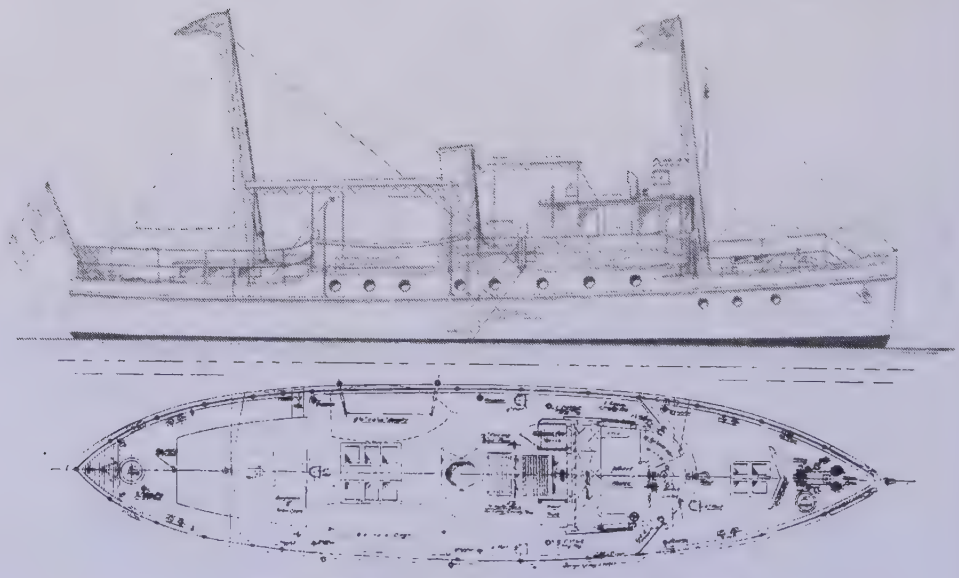
Length o. a.	75 feet 0 inches
Breadth	15 " 6 "
Draught	5 " 6 "



Profile and Arrangement Plan of a 75-Foot Cruiser, Designed by the Matthews Boat Company



Arrangement Plans of 60-Foot Cruiser, Designed by Bulkley & Halliday



Profile and Deck Plan of a 60-Foot Cruiser Built For a Canadian Yachtsman

60-Foot Canadian Cruiser

This 60-footer, built from designs by Bulkley & Halliday for a Canadian yachtsman, is a very attractive yacht. The model shows a double-ended vessel with a canoe stern, a sunken wheelhouse and a bridge deck outside at the after end and on top of the trunkhouse. This is over the after end of the engine room and the galley. The arrangement plan is good. There is a chain locker forward, then comes a toilet and washroom followed by the forward cabin, in which is a companionway on the starboard side leading to the wheelhouse. The engine room is next. This also has a companionway leading to the deck. In this compartment is a 54-h.p. Buffalo engine, a 300-gallon distillate tank and a 100-gallon gasolene tank. The distillate tank, generator and engine are on the port side.

The galley is aft of the engine space on the port side and contains a stove, sink, refrigerator, dresser, lockers, etc. On the starboard side is a bathroom. The galley and bathroom each opens into the main saloon, which is fitted with an open fireplace, a large sideboard and lockers and four comfortable berths. Aft of the saloon is the lobby, with companionway stairs leading to the deck on the port side and a toilet on the starboard side. The owner's stateroom is aft and is fitted with a double and a single berth, a large wardrobe, a dressing table and a locker. A 150-gallon tank for fresh water is installed in the lazarette.

Rudder Designing Competition

25-Foot Fishing Boat

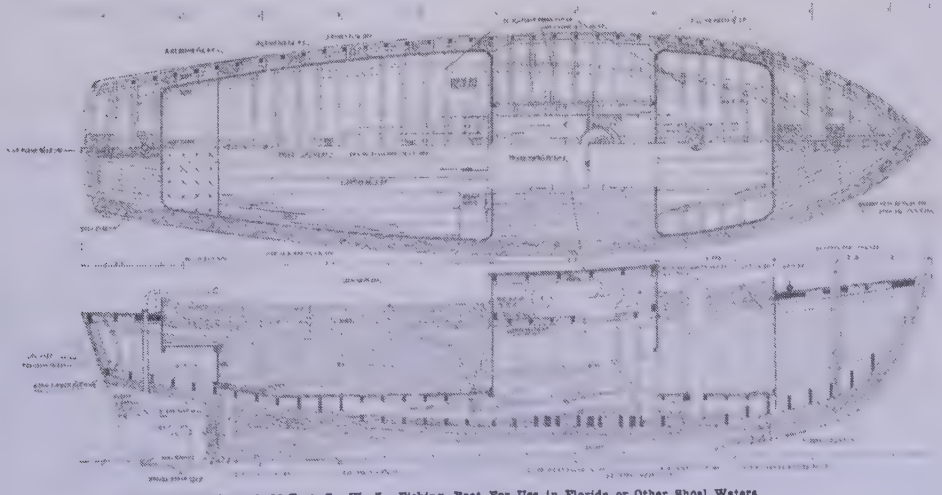
WITH this issue of THE RUDDER the plans of the third prize winners in the two RUDDER Designing Competitions that have been adjudicated by the judges are published. One is for a 25-foot fishing boat for use in Florida waters and the other for a 40-foot shoal-draught power cargo boat.

These competitions were very successful, as the designs already published have shown, and prove that the rising generation of designers has much talent. There are three other competitions yet to be adjudicated, but the judges are rushed with work and have been unable to get together to select the winners. It is hoped that the results will be received in time for publication in the next issue of THE RUDDER. These competitions were for the best interior arrangement of a 30-foot cruiser, the best arranged stateroom on a given floor space, and the best arranged galley, also on a limited floor space. This last competition attracted many designs and shows that the food question appeals strongly even to designers.

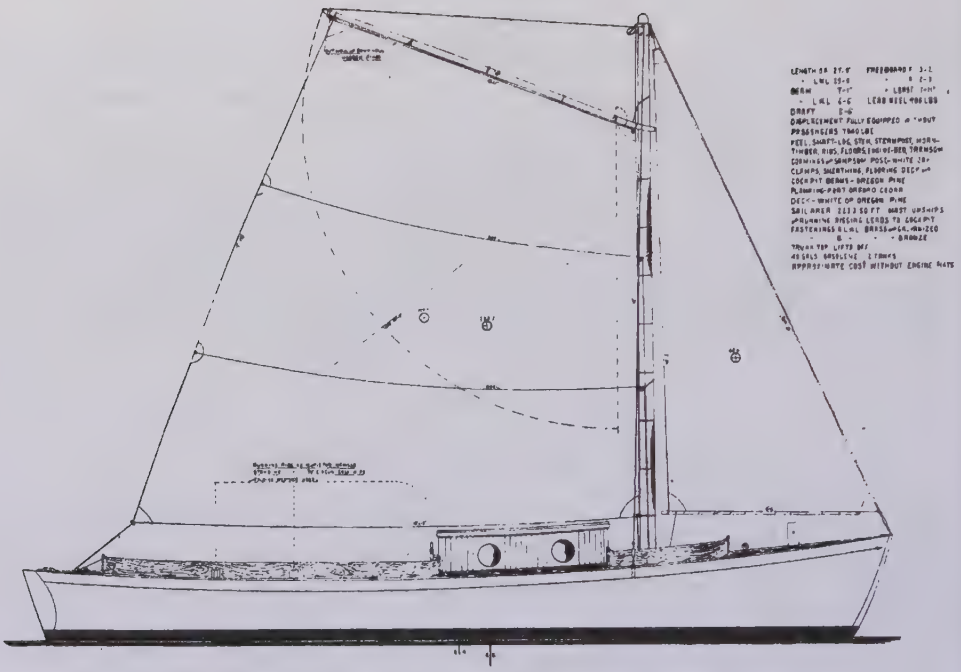
The third prize winner in the Fishing Boat Competition was Sidney M. Higgins, of San Francisco. The general plans are good, but the arrangement plan can be criticized somewhat. The forward cockpit is useless in a boat of this type. The rig too is rather poorly proportioned but this can very easily be changed. The lines are fairly good and the hard bilges are of benefit.

The general dimensions are:

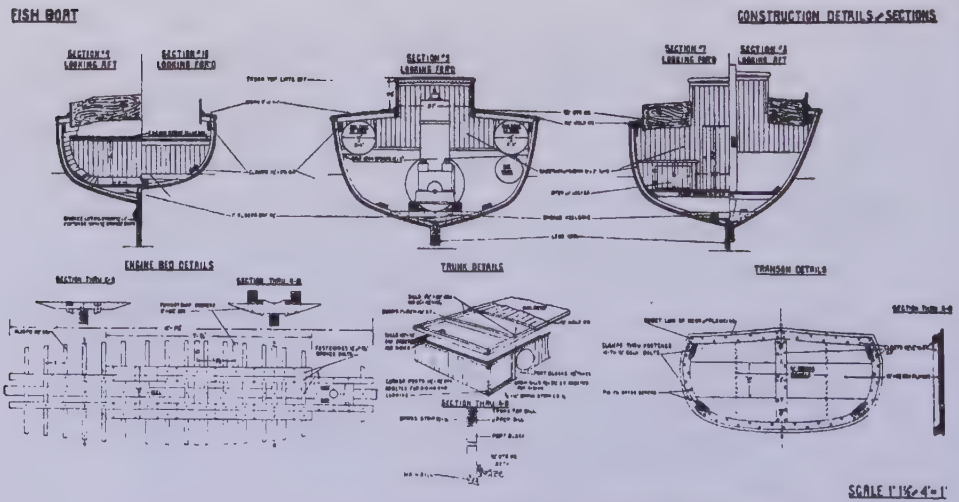
Length o. a.	27 feet 0 inches
Length l. w. l.	25 " 0 "
Breadth, extreme	7 " 1 "
Breadth, l. w. l.	6 " 6 "
Draught	2 " 6 "



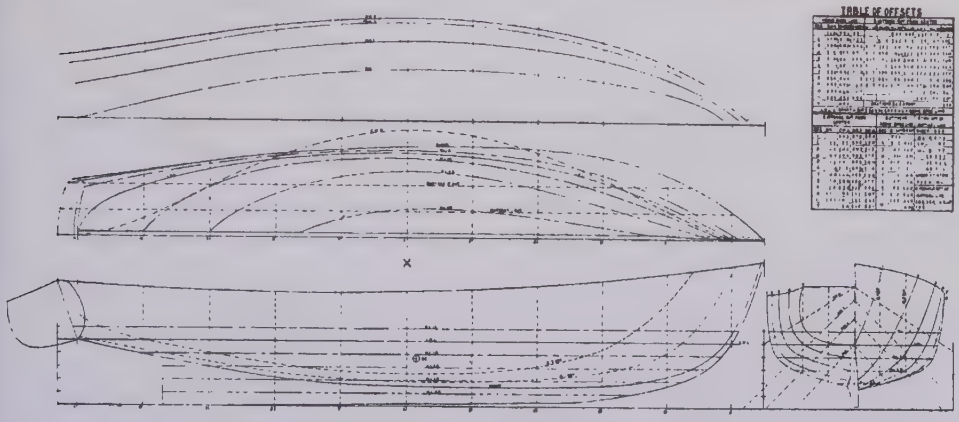
Construction Plan of 25-Foot L. W. L. Fishing Boat For Use in Florida or Other Shoal Waters



Profile and Sail Plan of 26-Foot Shoal-Draught Fishing Boat, Designed by Sidney M. Higgins



Sections of Fishing Boat Winner of the Third Prize in The Rudder Designing Competition



Lines and Table of Offsets of 25-Foot Fishing Boat, Designed For Florida Waters

40-Foot Shoal-Draught Cargo Boat

The third prize winner in the competition for a 40-foot shoal-draught cargo boat was won by F. E. Seibert, of Detroit, Mich., who marked his plans "Marlin Spike, Jr." The model developed by him shows a vessel that should be good for river work and for carrying light freight that is not heavy to handle. It is especially good too for the protection of the cargo. The steering wheel is too low for the location and the after bitts should be further forward.

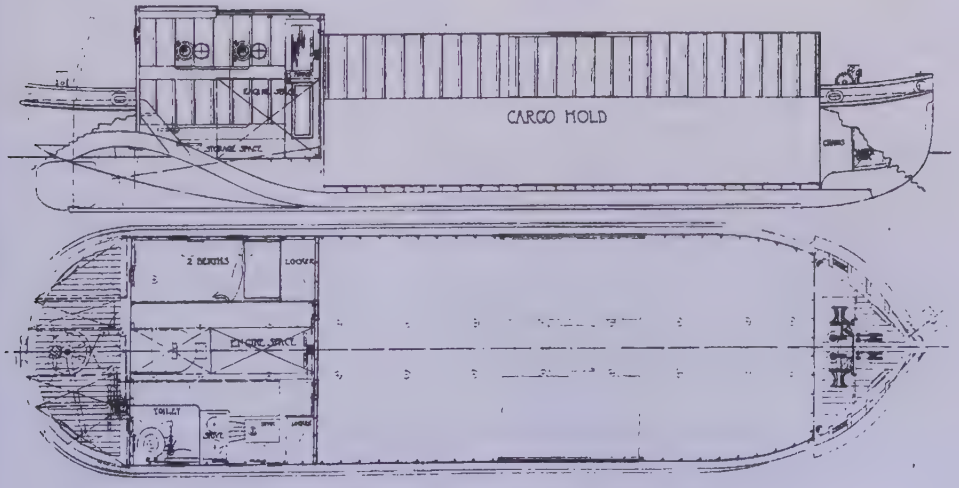
These plans have been drawn by probably the youngest designer in the competition. He is not yet sixteen years old, and his friends told him he had lots of nerve to try in such company as he was likely to meet. He had pluck, however, worked hard and his initial work has been very successful.

Mr. Seibert gives the following general details of his design:

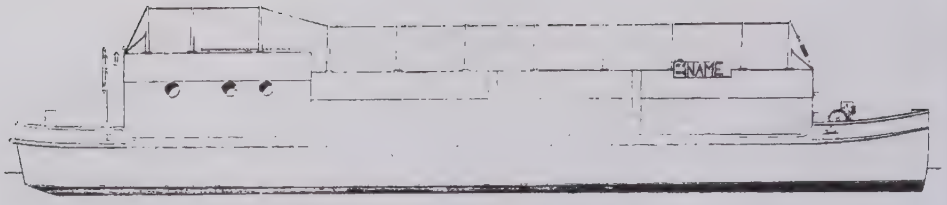
Cargo capacity, 7 tons; erections of ¼-inch mild steel; beams, 1½ by 1½-inch angle steel, 10 inches on centers; keel, 8 by 9 inches; deck beams, 2 feet by 4 inches; ceiling in hold steel, ¼ inch; planking, 1½-inch pine.

The general dimensions are:

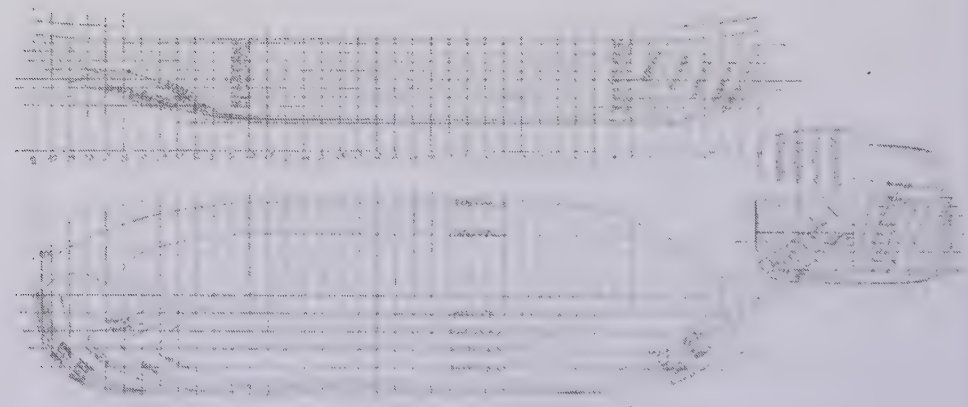
Length	39 feet 9 inches
Breadth	11 " 0 "
Draught	2 " 4 "



Construction and Deck Plan of 40-Foot Shoal-Draught Cargo Boat



Profile of 40-Foot Cargo Boat Well Suited For Uses on Rivers



Lines of 40-Foot Shoal-Draught Cargo Boat, Designed by F. E. Seibert, of Detroit, Which Has Many Good Features

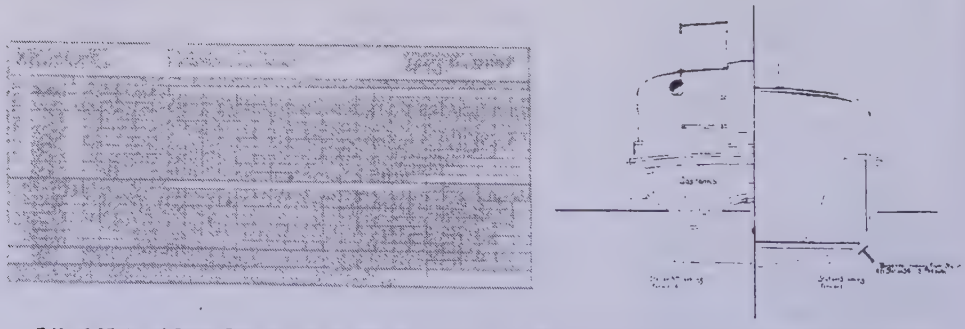


Table of Offsets and Section Plans of a 40-Foot Shoal-Draught Cargo Boat, Which Took Third Prize in The Rudder Designing Competition

Navigation for Beginners

By Clarence W. de Linden

Lieutenant-Commander U. S. Naval Reserve, Master S. S. Clare

Navigation is the main study just now with all yachtsmen and those interested in nautical affairs. Many have within the past few months realized that, while they can handle small boats and have some practical knowledge of seamanship, they have neglected one of the most fascinating parts of the sport, and that their lack of knowledge about navigation has seriously hurt their opportunities for advancement in those parts of the Naval Reserve in which they are enrolled.

To meet the present demand for such studies, Captain Clarence W. de Linden, Master of the steamship Clare and a Lieutenant-Commander in the U. S. Naval Reserve, has written a series of articles for the beginner. Captain de Linden is well qualified for this work because he is not only a master but he is also an instructor, and on his many voyages he has taught navigation to those who have made voyages with him for the purpose of learning the art of navigating the seas.

These articles are not written for the benefit of the qualified navigator, who, however, may learn something from their perusal, but for the man who wants to learn from the foundation without wading through heavy technical works before he gets to the practical part. There are many books written on Navigation, but the trouble with the majority of these is, their authors have taken for granted that the student knows more than he really does and consequently they are over the heads of the average yachtsman. Captain de Linden assumes nothing. He starts from the bottom and explains everything carefully and clearly as he proceeds.—[Editor]

NOW I am not going to write any yards of Preface as I have not the time for such luxuries, therefore, let us get on the job.

The Compass

The compass is one of the most important instruments used in navigation, so we will have a little talk about this very valuable and ever useful instrument which is in use in every branch of navigation, coastwise or offshore.

Almost every man who has been near the water or in boats has seen a compass; but there is much more to learn about it than can be acquired by a mere look at it. At the present time there are two kind of compasses: the old compass of our grandfathers and the modern one that has been changed by the U. S. Naval Department for the handiness of applying the corrections. These will be explained hereafter. First we will go to work on the "old reliable". A compass is a circular card which is supported by a needle-pointed pin in the center of the compass bowl, on which the card swings or revolves. Under the card are fastened one or more highly magnetized steel bars, which are called magnets. The positive ends of these magnets will always point to the magnetic North, provided that there is no local attraction. At a few places on the earth it will point to true North. The difference between the true and the magnetic North is termed a variation. This variation changes in different localities on the earth's surface.

Usually the inner edge of the circular card is divided into points, half points and quarter points, and in some cases into eighths of a point. The whole circumference consists of 32 points, from North around Eastward and back again to North. Bear in mind that if you are required to "box the compass" always commence from North and proceed as with the motion of the hands of a clock until you are back to North.

The outer edge of the card is marked in degrees as follows: North, 0, 10, 20, 30, 40, 50, 60, 70, 80, 90° on one quarter of the circumference of the card extending to the East point of the compass. In a similar way it is marked to the West point. Then from the South point of the compass beginning at 0, it reads toward East and toward West. Each of these quarters is 90° and they are termed cardinal points: total 360°.

Each point is divided into 11 degrees and 15 minutes of arc. The courses on this compass are reckoned from the North point of the compass toward the East and toward the West, and from the South point toward the East and toward the West.

The Naval Compass

The Naval Compass is reckoned from the North point of the compass from 0° to 360° continuously from North point, following the motions of the hands of a



The Old-Style Compass

clock back to North. This system makes the applying of the compass corrections very simple; as the only thing you have to do is: Add the correction that is to the right, and subtract the correction that should be applied to the left. Much confusion is saved by this system in correcting your courses, and every navigator should study it. I think this is sufficient about the Naval Compass and we will go back to our "old reliable." As the construction of the instrument has been explained we will proceed to the real work. The card of the compass is the part that my brother navigator must understand in every detail. Do not get discouraged if the thing is not very clear at first; a little study and patience and all will be well. Now there are 32 points on the compass card and each has a name. These names the student must learn and learn well if he would succeed. Learn to repeat in regular order the names from the North point by the way of East and back to North right hand or with the hands of a clock, as follows: North; North-by East; North-Northeast; Northeast by North; Northeast;



The New-Style Compass

Northeast-by East; East-Northeast; East-by North; East; East-by South; East-Southeast; Southeast-by East; Southeast; Southeast-by South; South-Southeast; South-by East; South. Now this is just one-half of our trouble, and let us begin again: South-by West; South-South-West; South-West-by South; South-West; South-West-by West; West-South West; West-by South; West; West by North; West-North West; North-West by West; North-West; North-West by North; North-North West; North by West; North. Here it is, the whole thing; just keep on and you will have it right.

This is called "Boxing the Compass." Any intelligent person can easily discover the system by which the points are named. North, South, East, and West are called the cardinal points; Northeast, Southeast, South-West, and North-West are called intercardinal points. Each cardinal point is 8 points from the nearest cardinal and 4 points from nearest intercardinal point.

In navigation all courses are reckoned from the North and South line of the compass, which are called the meridians. Thus: North-Northeast, South-Southeast, North-North-West, and South-South-West are 2-point courses; East and West are 8-point courses; Southeast-by-South is a 3-point course; South-by-West, a 1-point course; South ½ West, a ½-point course, etc. A student should study and get impressed on his mind the compass card, and see how many courses there are of each kind, and bear in mind that there is nothing greater than an 8-point course. After a careful study of the points, the student should be able to answer with facility such questions as these: How many 1-point, 2-point, 3-point, 4-point, 8-point courses are there on compass? How many points are there from South-East to North-West? From North to South-by West, etc.? Get the compass down to your finger-ends, so to speak. Until the student masters the whole points of the compass and their relation, he should not "skip" any of this work. When he has mastered the points, he should take the ½ and ¼ points in hand and study these very carefully.

The next step will be the study of angles each course makes with the meridian. Meridians are imaginary lines running North and South from pole to pole and which cut the equator at right angles. These imaginary lines are used to determine the Longitude, as will be explained later. The Meridian of Compass is so called because it is the North and South line, and may be regarded as coinciding with the imaginary meridian on which the ship is located. If the actual North and South line were ruled on the surface of the sea, and you started from a point on a course Southeast, you would find that you were making an angle of 45° from the meridian. Your compass will tell you the same thing. The circle, no matter how small or how large, has a circumference of 360° or 360 equal parts and are called degrees, and all angles are measured by these. One degree is 1/360 of the whole circumference of the circle. No matter how far the lines of an angle are prolonged, the angle will remain the same. Do not forget one very important fact: if you divide the compass card of 360° by its 32 points, you will find that 1 point equals 11° (degrees) and 15′ (minutes) arc; 2 points, 22° 30′; 3 points, 33° 45′; 4 points, 45°, as I will show in the table of angles of points and degrees. As a rule, with sailing vessels the course is given and steered in points, as it is impossible to steer a sailing vessel nearer than ¼ point of its course. But in modern and high-speed steamers the courses are given in degrees.

The North point of the compass indicates true or geographical North at only a few places on the earth. At all other places it points a little to one side or other of North, and this error is called the variation of the compass. It is caused by the fact that the Magnetic North and the South Pole do not coincide with the true or geographical poles. The former is several hundred miles South of the geographical pole, and the latter several hundred miles North of the pole. The needle is perfectly true. It points right at the magnetic North pole, and, remember, that the pole is not the North end of the earth's axis.

In navigating a vessel it is necessary to make allowance for this variation. The amount of allowance and the direction are given on the charts or are indicated on the compass rose. On the large ocean charts there are marked irregular lines which indicate the variation in such inscription as 15° West or 20° East. This means

that along this line or near it the variation of the compass from true North is 15° West or 20° East.

A compass card is divided as follows, giving the relative values of points and fractions thereof, corresponding to the degrees, minutes and seconds of arc.

North.		Points.	° ′ ″
N.	¼ E.	N. ¼ W.	¼ 2.48.45
N.	½ E.	N. ½ W.	½ 5.37.30
N.	¾ E.	N. ¾ W.	¾ 8.26.15
N.	by E.	N. by W.	1 ..... 11.15.00
N.	by E. ¼ E.	N. by W. ¼ W.	1¼ 14.03.45
N.	by E. ½ E.	N. by W. ½ W.	1½ 16.52.30
N.	by E. ¾ E.	N. by W. ¾ W.	1¾ 19.41.15
N.N.E.		N.N.W.	2 ..... 22.30.00
N.N.E.	¼ E.	N.N.W. ¼ W.	2¼ 25.18.45
N.N.E.	½ E.	N.N.W. ½ W.	2½ 28.07.30
N.N.E.	¾ E.	N.N.W. ¾ W.	2¾ 30.56.15
N.E.	by N.	N.W. by N.	3 ..... 33.45.00
N.E.	¾ N.	N.W. ¾ N.	3¼ 36.33.45
N.E.	½ N.	N.W. ½ N.	3½ 39.22.30
N.E.	¼ N.	N.W. ¼ N.	3¾ 42.11.15

			Points.	° ′ ″
N.E.		N.W.	4	45.00.00
N.E.	¼ E.	N.W. ¼ W.	4¼	47.48.45
N.E.	½ E.	N.W. ½ W.	4½	50.37.30
N.E.	¾ E.	N.W. ¾ W.	4¾	53.26.15
N.E.	by E.	N.W. by W.	5	56.15.00
N.E.	by E. ¼ E.	N.W. by W. ¼ W.	5¼	59.03.45
N.E.	by E. ½ E.	N.W. by W. ½ W.	5½	61.52.30
N.E.	by E. ¾ E.	N.W. by W. ¾ W.	5¾	64.41.15
E.N.E.		W.N.W.	6	67.30.00
E.N.E.	¼ E.	W.N.W. ¼ W.	6¼	70.18.45
E.N.E.	½ E.	W.N.W. ½ W.	6½	73.07.30
E.N.E.	¾ E.	W.N.W. ¾ W.	6¾	75.56.15
E.	by N.	W. by N.	7	78.45.00
E.	¾ N.	W. ¾ N.	7¼	81.33.45
E.	½ N.	W. ½ N.	7½	84.22.30
E.	¼ N.	W. ¼ N.	7¾	87.11.15
East		West	8	90.00.00

This is the Northern half of the compass card and explains it in whole, and should be studied well as it is all that is necessary to understand the fundamental part of this very important instrument.

(To be Continued)

A Notching Device for Reverse Levers

By Engineer

IN those power-boat engines which are fitted with fore-and-aft reverse levers, it frequently happens that the vibration of the engine will tend to shake the lever out of the position in which it has been set. This trouble was met in one case by fitting the simple and easily constructed notching device which is illustrated in the accompanying sketches.

The lever as usual had three positions, ahead, neutral, and astern, and it was accordingly necessary to provide means for fixing it firmly in any of these three, while still allowing it to be quickly released when required. It was also found that the neutral or middle position was liable to alter slightly, as the clutch faces wore down and the adjustments were taken up. Consequently the neutral position had to be made adjustable, to allow for this wear in the clutches.

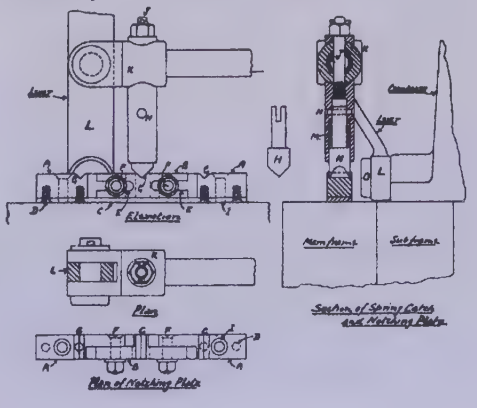
The fitting made to suit these requirements, consists of a spring catch, fixed to the knuckle at the forward end of the coupling rod, which connects the reverse lever to the clutches; and of a notching plate, with three notches corresponding to the three positions of the lever. The spring catch moves with the coupling rod and has a plunger which is forced by a spring into the appropriate notch.

The notching plate consists of four parts, two fixed pieces *A*, *A*, a movable piece *B*, and a connecting base *C*, of which the first three are made out of ¾-inch square mild steel stock (finished ⅝ inch square) and the last named out of 3/16 by 3/4-inch flat mild steel bar. The fixed prices *A*, *A* are fixed to the base *C* by four screws *D*, and the movable piece *B* has two slots *E* cut in it, gearing with two studs *F*, so that it can be fixed in any position, within the limits of its travel, relative to the fixed pieces *A*, *A*.

Three 90° slots *G*, ⅛ inch deep, are cut in the positions shown, two in the fixed pieces, and one in the movable piece. The latter is for the neutral position, which in this way is rendered adjustable, and the remaining two are for the ahead and astern positions, which are fixed. Into these slots, the plunger *H* is forced by its spring, as the lever is moved. The whole notching plate is secured to the main frame on the port side of the engine bed by two screws passing through holes *I*.

The spring catch body is turned to ¾-inch diameter out of mild steel, and is fixed by a stud *J* passing through a hole in the knuckle *K* just behind the lever *L* (which is hinged to the crank case at *O*). In it works the plunger *H*, actuated by its spring *M*, and held from turning by a riveted pin *N* passing through a slot in its shank. The total travel of the knuckle *K* was, in this case, 3¼ inches, and the over-all length of the notching plate 5½ inches. An adjustment of ¼ inch either way from the center was allowed for the neutral position.

A merit of this fitting is that it can be made up very quickly by any fitter from odd pieces of bar steel or wrought iron. In actual use it has proved to be very satisfactory in its working.



Trouble, Trouble Everywhere, and Not a Drop to Drink

By Charles A. Starr

IT beats all how a perfectly good engine, a well-built boat and a husky man, with a top piece filled with average gray matter, can find trouble without looking for it. The early days of the 1917 season have not been any freer, apparently, in this respect, despite the bunch of good advice which was handed out to the "bugs" at the Boat Show and in this, their favorite "dope book".

Yet, in spite of trouble finding them without invitation and coming to stay, sometimes, few there are to return the compliment by finding the trouble. That is, to really find it and not simply know it is there. I know all about the maxim that he who hunts trouble surely will find it; but that is not true along the waterways, unless he be an educated cuss who has tamed the gas engine and taught it to eat out of his hand. The trouble is they cannot find the trouble. Sometimes it fools the expert and the machinist and gas engineer, too.

I watched one of the experts work for an hour on a recent Sunday afternoon trying to find a knock in a Buffalo engine, a husky 100-h.p. machine which had not been overhauled this year, and which, I suspect, had done such good work last season that the owner felt that he did not need to touch it, with the result that it was gummed up and dirty and rusted. No wonder it got sore and began to knock. The owner brought it to George Auer, at Clason Point, to diagnose the trouble and treat it. Seeing that there are only some fifty-seven varieties of knocks he had a few things to do.

> Full many an engine click and squeak serene
> The dark, dank bilges 'neath the cockpit bear;
> Full many a knock is born to thump unseen
> And banish sweetness from the cabin air.

As the knock sounded like a sticking valve, the hand plates were removed so that the valve movement might be watched as the engine was turned over by hand. Yes, there was some sticking, particularly one of the six exhaust valves, which was gummed up. But when this was remedied the knock was still there. The inlet valves were examined the same way and slight troubles fixed, in some cases the valve caps being removed.

As the knock was audible when the engine was turned over by hand, plainly it must be from a mechanical cause, so there was nothing to do but hunt further and eliminate one after another the known causes of knocking. Strangely the noise now seemed to come from another direction and was thought to be in the timing gears, to which the cam shafts, pump and starting engine were all related. Off came one of the gear cases to find the broken tooth which made the sound, but no tooth was broken, the gears meshed properly and gave not a sound. The will o' the wisp had not been found.

But now luck came to the aid of mechanical genius and in an unusual manner the cause of the trouble was found. Leaning over to examine the gears Auer rested his arm on the rotary pump while the engine was turned over. It vibrated beneath his hand, the vibration being plainly visible as I leaned over the coaming to watch the process. "I feel it," and "I see it," came together; but the mystery was not yet solved, though it was run to cover—the pump cover. Off came the casing and everything seemed in perfect order, and it was necessary to turn the engine over several times before it was found that the valve was sticking in the vane because of gummy oil that prevented free movement. The pump has a valve working in a slot, which moves to conform to the walls of the pump with each turn of the pump shaft, the vane having an eccentric motion. It is this valve which lifts the water. It is in two pieces, held apart and against the pump walls by a spring. One side was sticking so that it did not spring out until late and then hit against the pump case and made a knock, and then a grinding or chattering sound. A piece of waste to remove the gum and a few drops of fresh oil ended the trouble and the knock.

I have told this in considerable detail to show how obscure are some of the troubles which overtake a fellow and how much time it takes even a mechanic to find out what the trouble is and to remedy it. How much more then ought the owner of the craft to have some knowledge of his engine and its requirements, that he might keep it in order and be able to coax it in shape when something goes wrong out on a cruise?

I was talking over this case with H. C. Brokaw, principal of the School of the West Side Y. M. C. A., and he told me some of the things which had come under his observation along the same line. One of these concerned the school demonstration boat, which developed a knock when out with a class and which defied detection for a long time. The engine had been overhauled before the boat went into commission and it was known that the wrist-pin bearing and the crank-shaft bearings were tight, yet the engine had a very positive knock. It turned over fairly easy, indicating that it was receiving proper lubrication. The spark was checked up to make sure that it was not timed too early, the water pump was examined to see if it was at fault, likewise the reverse gear. But the knock was there with no apparent cause. After eliminating a score of possible causes, experience and rule led the searchers next to the flywheel, to see if it was loose. It was. The key had been put in, but it had not been driven home. Of course, when the key was tightened the knocking was over.

Last Summer the owner of a cruiser on the Hudson River was still shaking when he told me of an experience on the way home with a loose flywheel, which he declared was almost off the shaft and "in a few minutes more would have gone clear through the boat." Of course there is little likelihood of such an accident, since the incline of the shaft in most boats would tend to make the wheel hug the engine instead of flying off the end of the shaft.

When the flywheel becomes loose the key rocks in

the keyway and breaks down the side walls of the seat, gradually wearing them until the keyseat is V-shaped and it is impossible to fit a key that will set tight. Then the only thing to do is to cut the keyseat larger with perpendicular side walls and use a larger key.

Mr. Brokaw told me that he had seen a case where the loose key had been overlooked for so long that the hub of the flywheel had become cracked, necessitating a replacement. In a similar case it had been possible to shrink a piece of seamless tubing over the flywheel hub, and then cut a new keyseat. He told further of one engine which could not be persuaded to start because the flywheel was loose on the shaft. There was enough play so that when a spark exploded the charge in one cylinder the crank would turn quite a distance without turning the flywheel at all, and the wheel did not have momentum to carry the shaft along so that the next cylinder piston came up on compression for firing.

When a flywheel isn't fly
It is apt to be some shy.
If it doesn't turn the shaft
How you goin' to run the craft?

This is only one of the causes of trouble, however. I had an experience with the steering gear on a 20-foot open boat which taught me to be very careful, before going on a trip, to see that everything was all right in this direction.

I had planned a week-end trip down the river and bay to Highlands, where some friends had a Summer camp. I left the anchorage in the early afternoon and all went well until I reached the ferry-lane between Twenty-third Street and the Battery, when I did more turning about and tossing about than I had thought a small boat could endure. One who has not had the experience can hardly comprehend the swirling, choppy, boiling and eddying mixture of tide and swell but I kept ahead in spite of the Summer afternoon rush of boats and my own inexperience, and had no more trouble until almost at the end of my trip in the quiet waters behind Sandy Hook.

I followed the main channel which heads past West Bank Light straight for the Hook. Nearing the last buoy, where the ocean steamships turn to go out past the Hook, I steered into the middle of the channel to avoid a Sandy Hook boat coming down. There was a sea-going tug and tow on either side of the channel, but plenty of room between for my cockle shell under ordinary conditions. Then something gave way.

I shall never forget the moment of hopelessness when I found that the wheel would not control the boat. It took but an instant to discover that a steering rope block had pulled loose, but I had no means of replacing it and the boat was drifting with the tide; but with two tows at hand, with the swells of which I had to reckon, there was no time for dreaming or speculation. It was time to do something.

When the steering gear goes wrong
And danger looms up strong,
The man worth while
Will up and smile
And somehow sail along.

The salt spray, whipped by the stiff breeze which blew in from the ocean, had become more than a mist and the engine was beginning to miss fire once in a while, and I knew that the mist was threatening to short-circuit the spark plugs. There was no cover to the engine. I rigged an awning with the boat-hook and then turned to solve the steering problem.

I found that the wheel worked all right one way, so with one hand on the wheel and the loose steering rope in the other I manipulated the boat until free of the tows and then headed for the Hook. It was dark when I was within the Horseshoe, but before I reached the dike it was black and had I not known the channel I should not have reached my destination safely. As it was, I ran on the soft sand near the dike, but was able to back off and a little later ran to anchorage in front of my camp destination. I had made the distance at an average of 7 miles an hour, which was fair, considering the obstacles.

When I fixed the trouble next day you may wager that I did it thoroughly, for one more such experience would have been several times too much. Suppose the break had come when I was in the ferry-lane with two or three ferryboats bearing down upon me!

Gas troubles are the most frequent to annoy the cruiser. Most of this is preventable, but there is one thing,—water in the gasolene,—which is not wholly preventable and is only rendered harmless by constant watching. Water in the gas may not be the fault of the gas man at all. I am willing to give him a clean slate so far as water is concerned, and yet may have quite a bit of water to get rid of at that. You see, gasolene is vaporizing constantly and that lowers the temperature in the tank, and this being lower than the atmospheric temperature there is condensation of whatever moisture may be in the air inside; around the water this is considerable on most occasions. The faster the gas is drawn from the tank the more will be the condensation for the more moisture-laden air is drawn into the tank.

There is no way to prevent it and it must be accepted as a fact and some means be taken to obviate the difficulty it makes. There should be a device for separating the water from the gasolene on the gas line between tank and carbureter, and this should be opened to drain off the water and dirt at regular intervals.

Tanks rust and the spelter lining scales and there is a sediment in the bottom of the tank. This runs off into the pipe line and collects at angles or dips and unless there is a strainer clogs the carbureter. In automobiles now this is recognized and strainers are being installed where copper tanks are not used, and they are few in these days. The tanks must be cleaned each Spring and to do it thoroughly must be removed from the boat.

Then there are leaky joints to contend with, leaky pet-cocks and valves that become loose and either leak or vibrate partly closed and do not let enough gas through; or perhaps the strainer becomes clogged and will not let enough gas through to run the engine with side open throttle. I had that experience last year. The engine ran beautifully on retarded spark and almost closed throttle, but when I attempted to start up it soon began to cough and stop. By the time I reached the engine the float pin was bobbing high and yet there was every indication of a short gas supply.

I fooled that float pin by starting up the engine full and running back in time to see the pin go down. Then I went to the strainer and drew off half a cup of gas filled with sediment. After that the engine ran all right.

Little drops of water,
Little grains of sand,
Mixed with gas will make one
Cuss to beat the band.

The troubles just related constitute most of the so-called carbureter troubles. Adjusting the carbureter does not do any good when these things are wrong. A great many fellows complain that the carbureter will not stay in adjustment; that it never works twice the same way. This usually may be traced to some one of the foregoing conditions. The carbureter should not be tinkered with every time the engine coughs. Neither should the speed of the engine be controlled by the carbureter adjustment. The needle valve should be adjusted for slow speeds and the auxiliary air valve for high speeds. Once adjusted, let both alone; if there is trouble, hunt for it somewhere else. Carbureters do not get out of adjustment unless aided by someone's fingers.

There are some squeaks developed about a marine engine which are hard to locate. One of these is a squeaky pump, which sounds for all the world like a tight bearing. Mr. Brokaw told of hunting all over for a squeak in the school boat, and finally finding that the vane in the pump was rubbing against the side of the case.

The plunger pump also has a squeak if packed too tight, or if not in perfect alignment when the packing gland is tightened. On my present engine, a Barker, the maker cautions against this, advising that the engine be turned over a few times before tightening the gland.

Another mysterious squeak sometimes comes from the magneto brushes. These run dry and are supposed to lubricate themselves, but occasionally they develop a squeak. Usually a suspicion of grease remedies this and it has been recorded that even the grease from the fingers will do the trick when they are rubbed over the commutator.

There are dozens of other little things which come to perplex the power-boat "bug," but a little persistent study of the power plant and the exercise of common sense usually will find the cause of the trouble and end it. Most of them have their origin in some minor thing forgotten or overlooked; they are not the fault of the mechanism, but of the mechanic; they are conquerable by the exercise of gumption. Nevertheless, I suppose the man who has learned gas-engine operation in a systematic way, will have the more comfortable time of it, all things considered.



First Contingent of U. S. Troops Arriving in a French Seaport. Collier Neptune, Which Carried Supplies, and Two of the Destroyers, Which Acted as Convoys, on the Right, and Two Transports on the Left

The Naval Reserves Activities

THE work of fitting out the fleet of yachts and some commercial craft taken by the Government for coast defensive purposes is progressing at the many yards where such work is being done, and as the different boats are equipped they are manned from the enrollments in the Coast Defense Reserve and sent out to sea. The majority of the men enrolled in this division of the Naval Reserve are yachtsmen and have usually devoted leisure time during the heated term to either racing or cruising on the Atlantic Coast or the Lakes. This year they are at present enjoying some practical yachting, only in a more strenuous way. They are patrolling the coast watching for submarines or other enemy craft, and are practicing gunnery, signaling, and the many duties that come in the every-day life of a man-of-war sailor. They are getting new experiences, and when they return to the simple life they will be much more expert as yachtsmen and will know just how to do the many things that come in boat sailing intuitively, because they will have learned by experience. Just now they are experiencing their new life under comparatively pleasant conditions but later, when the cold winter storms blow, they will have strenuous work to do, just as the British yachtsmen have had in the North Sea and the English Channel.

The first four Naval Districts are the most active in this work, because in these districts there are more yachts and yachting than in all the others combined. Boston is the headquarters of the First District, Newport of the Second, New York of the Third, and Philadelphia of the Fourth, and in these more than five-hundred vessels have been turned over to the Navy Department for use as scout patrols. THE RUDDER last month published a list of one hundred and ten vessels that had been taken by the Government, and it publishes another long list this month. Of these some are now in European waters fighting the submarine and doing other important patrol work. On board these boats are many who volunteered for foreign service and have been transferred from the fourth to the second class of the Naval Reserve.

The Fourth District, where power yachting has long been fostered by members of the many clubs on the Delaware and in Southern New Jersey, is very active in the scout patrol work. This division last year turned out a large fleet of vessels for the Naval Training Associations' maneuvers, and Commodore Charles Longstreth, W. Barklie Henry, John Price Wetherill, Jr., J. Fred Betz, 3d, L. H. Eisenlohr, E. T. Stotesbury, John H. R. Cromwell, and others were very active in the preparedness movement. Now the Fourth District has a large fleet of scout patrols and many vessels are fitting out at different yards to take up the work as soon as possible.

F. M. Kirby recently purchased the Cristina, a Gielow-designed boat which was built in 1908 for Frederick C. Fletcher, of Boston. Mr. Fletcher sold that yacht when he had a larger one built, and Cristina has been named Esperanza, Jorosa, and now Suzanne, as she has changed owners. This yacht is 110 feet long, 17 feet 6 inches breadth and 6 feet draught. She was built by Lawley and was purchased by Mr. Kirby from Colonel Buckner, of Wilmington, Del. She is driven by two six-cylinder Standard engines of 125 h.p. each, and her tanks will hold 2,100 gallons of fuel. With this fuel she can hold her station for two weeks easily and she can carry stores sufficient for ninety days, so that she makes an ideal patrol boat. She carries three officers and fifteen men. Her commanding officer is Ensign Samuel Wetherill; John Harrison, Jr., is the executive officer, and H. A. Lanphere is machinist. She mounts a three-pounder gun forward, a one-pounder aft and three machine guns.

Among other yachts fitting out are H. J. Crozier's Dianthus, a Herreshoff-built 65-footer, equipped with Sterling engines; C. J. Eisenlohr's Miramar, a steel



Scout Patrols of the Fourth District: Dianthus, H. J. Crozier; Miramar, C. J. Eisenlohr; Elf, L. H. Eisenlohr, and Sybilla III, J. F. Betz, 3d



Suzanne, S. P. 570, F. M. Kirby, Owner, Equipped With Two Standard Engines

vessel 115 feet 7 inches over-all length, built in 1910 by the Gas Engine & Power Company; Sybilla III, owned by John F. Betz, 3d, formerly the Paragon, a steel vessel 120 feet long, built by Jacob from designs by Swasey, Raymond & Page, and equipped with Winton engines; Louis H. Eisenlohr's Elf, a 52-footer, built last Winter by Van Sant at Atlantic City, from designs by Bowes & Mower, and equipped with Van Blerck engines; John Price Wetherill, Jr.'s Little Aie, a 57-foot vessel, built by Smith & Williams, from designs by J. Murray Watts; Louis F. Hall's Tern, a 52-footer, built by Murray & Tregurtha, and equipped with Murray & Tregurtha engines, and many others.

Yachts in Government Service

THE RUDDER last month published a list of yachts taken by the Government. Another list is published herewith.

STEAM YACHTS

*Adelante, formerly Oneida, E. C. Benedict	138
Adroit, F. H. McAdoo	141
*Aphrodite, Col. O. H. Payne est.	303
Chicota, Edwin Gould	81
Druid, formerly Rheclair	213
Elreba, Mrs. H. Darlington	152
Irene, Michael Dreicer	155
*Juniata, Geo. W. Elkins	138
Machigonne II, William L. Douglas	140
Mohican, Robert P. Perkins	144
Naushon, James Shewan, Jr.	163
Ranger, Thos. W. Slocum	145
Reposo II, Theodore Krumm	140
Scout, August Belmont	81
*†Surf, Dr. John A. Harris	200
Vedette, Fred'k W. Vanderbilt	199
Wadena, J. H. Wade	176
*Wissahicken, Mrs. C. W. Henry	120

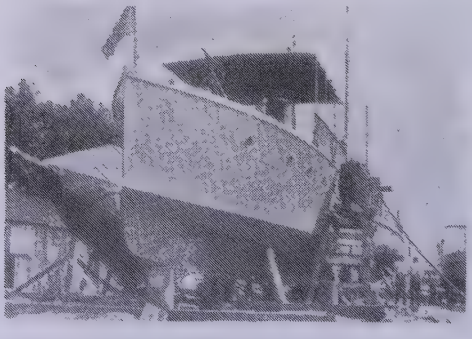
SOLD TO RUSSIA

Alberta, Fred'k G. Bourne	278
Diana, C. Ledyard Blair	253
Cyprus, D. C. Jackling	266

POWER YACHTS

Absagami, Allen K. White	75
Agawa, A. P. Brush	50
Arroyo, Archer M. Huntington	46
*Artmar III, Clarence M. Dunbar	64
Bagheera, J. W. Kendrick	65
*Barracuda, R. W. McEwan	60
*Calabash, W. J. Matheson	70
*Clarinda, I. S. Florsheim	98
Cobra, Thomas A. Mullen	55
*Coco, W. J. Matheson	36
*Corinthia, C. Beresford Fox	85
Dawn, Franklin Farrel, Jr.	50
Dean II, Forrest M. Towle	42
Donaire, A. W. Stanley	98
*Drusilla, A. J. Drexel Paul	83
Edithia, John H. Hanan	99
Eleanor, Alanson B. Houghton	57
Elf, Louis Eisenlohr	52
*Enaj III, Thomas G. Bennett	89
*Fli Hawk, C. V. Coachman & W. C. Moulton	81
*Georgiana III, E. T. Stotesbury	95
Gladiola, Coburn Haskell	67
*Glendovee, Ernest Lee Jahncke	74
Gula Gula, J. D. Newman	—
Helianthus, N. G. Herreshoff	64
*Karibou II, Harwood Spencer	65
Katydid, Arnold G. Dana	40
*Kestrel II, Guy P. Gannett	107
*Kuwana II, Frank A. Egan	55
La Mascotte IV, F. C. Havens	104
*Lanai, Clarence C. Campbell	34
Lomado, Dr. Frederick T. Rogers	69
Lydia III, Zenas W. Bliss	55
Lynx II, Nathaniel F. Ayer	58
Magistrate, H. S. Vanderbilt	63
Manatee, J. B. Fallon	35
*Marold, Louis K. Liggett	100
*Marpessa, W. J. Matheson	50
*Mauna Loa, Mrs. Arthur Curtiss James	56
Merito, B. C. Dunlop	60
Mira, Chas. Lane Poor	44
Miramar, C. J. Eisenlohr	115
Navajo III, Arthur P. Clapp	67
*Nirvana II, J. H. Merrick	65
*Pelican, Howland Gallatin Pell	57
Petrel, A. I. du Pont	40
*Priscilla, S. P. 44, Fred'k S. Fisher	67
*Quest, Daniel Bacon	60

*Loaned. † Red Cross.



Little Aie, John Price Wetherill, Owner, on the Ways Ready For Launching



Tern, Edwin F. Hall, Owner, 52 Ft. Long, Murray & Tregurtha Engine, Fitting Out For Patrol Duty

*Quicksilver, Ernest Lee Jahncke	50
Qui Vive, Houston Barnard	45
Raccoon, Francis E. Fabyan	50
*Rampant, J. A. Serrell	66
*Rickwood, Allen H. Woodward	75
Rush, Norman H. White, Jr.	55
Sayonara II, Charles Blum	74
Secret, J. N. Baker	40
Seneca, Johnson Lighterage	90
Shrewsbury, U. H. McCarter	98
Simplicity, N. Y. Y. L. & E. Co.	60
Sunbeam III, R. B. Roosevelt	52
Tarpon II, Bruce S. Sheldon	40
Venture, Mrs. G. F. Silsbee	80
Verdi, Walter J. Green	75
Wandena, J. Brooks Nicholls	65
*Wasaca III, John J. Martin	53
Weemootah, A. Gardiner Cooper	70
Whirlwind, Julius Fleischmann	111

* Loaned.

The Honor Roll

Thousands of yachtsmen in all parts of the country have responded nobly to their country's call and have enrolled in the Army, the Navy, and other branches of the service. They are now in active service, some at home, some in camps, and some already in France or on the ocean. THE RUDDER recently suggested that the names of these men should be inscribed on an honor roll. Each club should in some way post the names of its members who are now helping their country. These names might be published in the club book or they might be posted on a board or frame in the clubhouse, where all may see who are helping in these times. Some clubs have already taken kindly to this suggestion and honor rolls will be found in their clubhouses.

In order to get as complete a list as possible of these men THE RUDDER recently wrote to the secretaries of many of the yacht clubs, asking for the names of those who are now in the country's service. Replies have been received from several clubs, some have given the list, and others have promised to obtain them as soon as possible. The list as it has been received up to date is as follows:

INDIAN HARBOR YACHT CLUB

Leonard H. Dyer ..... { Lieutenant, Commanding Bridgeport District N. R.
Robert H. Meineke ..... Machinist's Mate, 1st Class
Henry Outwater ..... Quartermaster
Francis S. Page ..... Chief Boatswain's Mate

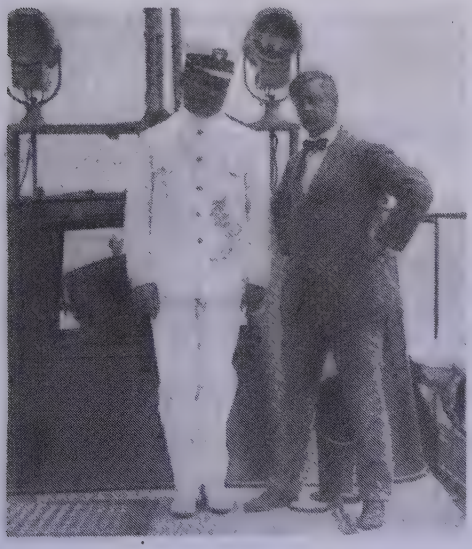
BALTIMORE YACHT CLUB

GOVERNMENT SERVICE—NAVAL AND MILITARY

Robert D. Bartlett
B. G. Bird
J. S. Fulton, Jr.
W. W. Grier
Graham W. Glass
Dana A. Hodgdon
W. D. Lamdin
Hughlett W. Naylor
Robert Phillips
Harvey Rowland
Glover C. Trenholm
Dr. E. H. Kloman

LYNN YACHT CLUB

A. J. McKenzie ..... Ensign Naval Reserve



© Brown & Dawson

Lieutenant Frost, U. S. N. R., and Designer and Builder Luders in Deep Thought



© Brown & Dawson

66-Foot Patrol Boat Built For U. S. Navy by the Luders Construction Company; Fitted With Van Blerck Engines; Speed 30 Knots

BAYSIDE YACHT CLUB

Naval Reserve

Alexander W. Moffat ..... Ensign
Walter P. Groszmann ..... Ensign
Paul Falconer ..... Chief Quartermaster
Norman E. Donnelly ..... Chief Quartermaster
Wm. J. Lee ..... Coxswain
Anson G. Purchase ..... Chief Yeoman
David H. Markell ..... Chief Yeoman
Walter S. Dayton — Arthur Logan
Carlton Copp — C. H. Medicus
Walter H. Funke

Naval Militia

Walter L. Powers ..... Lieutenant
C. Lawson Willard — Ferris Smart
L. D. Warner, Jr. — William Nash Webb
Fred C. Smith

Aviation Corps

Philip Benson

Officers' Reserve Corps

Marshall Coleman ..... 2d Lieutenant
J. C. Chrisman ..... 1st Lieutenant
Chas. M. Swezey ..... 2d Lieutenant
Frank H. Van Winkle ..... 1st Lieutenant
Van Wagenen Pingry ..... 1st Lieutenant
Charles H. Mellor

Quartermaster's Reserve Corps

Douglas Van Riper

Officers' Medical Reserve Corps

Dr. A. F. deGraffenried ..... 1st Lieutenant

American Ambulance Field Service

Francis J. Wakem ..... (Now in France)

COLONIAL YACHT CLUB

Naval Reserve

Sigmund Cohn ..... Ensign
David Crow ..... Ensign

GRAVESEND BAY YACHT CLUB

Joseph G. Breaznell ..... Chief Electrician, Ft. Lafayette Bas
John K. Birch ..... Quartermaster, 1st Cla
George Harr ..... Quartermaster, 1st Cla
Harold D. A. Martin ..... Gunner, 1st Class, U. S. S. Nom

CAMBRIDGE YACHT CLUB

Chaplain G. Hicks ..... Naval Reserv
W. Briley Wright ..... Naval Reserv

ORIENTA YACHT CLUB

Naval Reserve

George Gardiner Fry ..... { Lieut. (J. G.), Commanding U. S. Idalia, S. P. 270, Stamford, Conn
John W. Chapman, 3d ..... Quartermaster, 1st Cla
Richard Savage ..... Coxswai
Rossiter Maurice ..... 1st Class Seama
R. C. Brennecke ..... 2d Class Seama
Pierre Mosser ..... 2d Class Seama
William P. Herdman ..... 2d Class Seama
George Gardiner Fry, Jr. ..... Boatswain's Mate, 1st Cla
Charles H. Beckley ..... Coxswa

Navy

James Turner ..... U. S.

Army

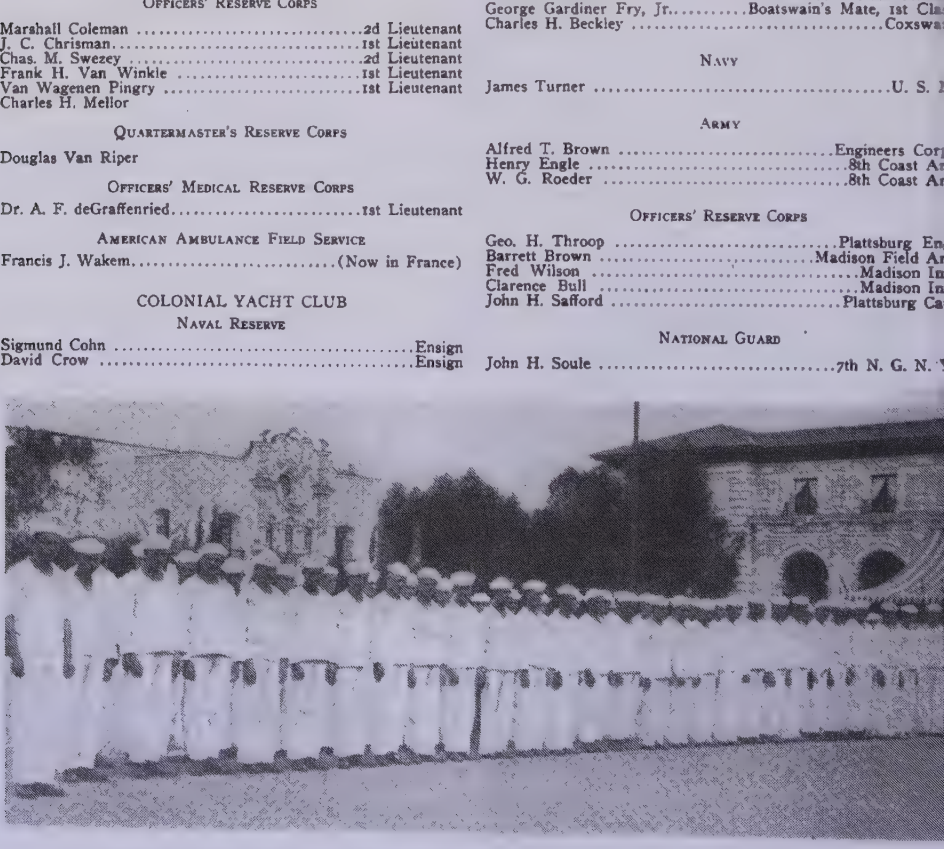
Alfred T. Brown ..... Engineers Cor
Henry Engle ..... 8th Coast Ar
W. G. Roeder ..... 8th Coast Ar

Officers' Reserve Corps

Geo. H. Throop ..... Plattsburg En
Barrett Brown ..... Madison Field Ar
Fred Wilson ..... Madison In
Clarence Bull ..... Madison In
John H. Safford ..... Plattsburg Ca

National Guard

John H. Soule ..... 7th N. G. N.



Naval Recruits of the Training Station at San Diego Drilling on the Panama-Pacific Exposition Grounds, Where They Are Quartered

Licenses for Power Yachts

THE Navy Department now requires that all vessels that are used in defensive sea areas must be licensed. These licenses are to be obtained from the Commandant of the Naval District in which the boat belong. There are thirteen Naval Districts and the headquarters of these districts are as follows:

First District, Eastport, Me., to Chatham, Mass., Commandant, Navy Yard, Boston; Second District, Chatham, Mass., to New London, Commandant, Naval Station, Newport, R. I.; Third District, New London to Barnegat, Commandant, Navy Yard, New York; Fourth District, Barnegat to Delaware Capes, Commandant, Navy Yard, Philadelphia; Fifth District, Commandant, Norfolk, Va.; Sixth District, Commandant, Charleston, S. C.; Seventh District, Commandant, Key West; Eighth District, Commandant, New Orleans; the Ninth, Tenth and Eleventh Districts are on the Great Lakes. The Twelfth District is on the Pacific Coast, Commandant, San Francisco; and the Thirteenth District, Commandant, Puget Sound, Washington.

Rear-Admiral Usher has divided the Third District into nine sections, because of the size and importance of the District, and each section is in command of a lieutenant. Applicants for licenses must apply to the commander of section in which he resides. Members of yacht clubs can apply through the officers of their clubs and by so doing will expedite matters. The application which has to be filled in must have the name of the vessel, the length, rig, power and engine number, owner's name, and the club to which he belongs. It must also have a certificate of character from some citizen. The patrol fleet will watch all power and other boats very closely and should one be caught without a license it will be sent to the nearest port. At the same time the law which requires that all boats carry proper life-saving equipment, lights, etc., will be strictly enforced, so it behooves all owners to see that they have the proper number of life-preservers, etc., on board as well as two copies of the power-boat regulations and the pilot rules.

The notice to mariners issued by Rear-Admiral N. R. Usher, U. S. N., Commandant of the Third District, follows:

1. The Navy Department directs that all vessels engaged in the navigation of waters of Naval Districts or in the navigation of defensive sea areas be licensed by the Commandant of the Naval District in which they belong.

2. It is expected that the granting of licenses will be commenced about July 1st.

3. The Department has no intention of placing any undue restrictions on traffic, but must be cognizant of the character of the vessels navigating the waters of the United States.

4. Every vessel will be required to carry its license on board and exhibit the same to an inspecting officer.

5. Failure to carry a license from the Commandant will render a vessel liable to detention and to being sent to the nearest port for examination.

6. Any person applying for license will be required to submit satisfactory reference as to his intentions, loyalty and good character.

7. Members of an organized yacht club or company may obtain licenses through the club or company. An individual owner may obtain license by appearing in person before a License Officer and producing the required reference, as above specified, or by written application.

8. It is desirable that every vessel owner making application for license shall first inform himself as to the Naval Section in which he resides, and make application to the Commander of such Section.



Ardea, N. H. Easton, Owner, Length 60 Ft., Breadth 12 Ft., Draught 3 Ft. 6 In.; Built From Designs by George H. Anthony, by the Matthews Boat Company, Equipped With a 4-Cyl. 6-In. x 8-In. Standard Engine

9. On and after July 1st, an application for license may be made at Room 10, Barge Office, New York City, in person or by writing to the License Officer there in charge. Owners of vessels located about New York may apply for license at Room 10, Barge Office, or to the Section Commander at Bath Beach, Tompkinsville, or Whitestone.

10. The Third Naval District extends from New London, Conn., (Goshen Point), to and including Barnegat, N. J. The District is divided into nine sections, the Headquarters of which are as follows:

Section No. 1. Headquarters, New Haven, Conn.
Section No. 2. Headquarters, Bridgeport, Conn.
Section No. 3. Headquarters, Port Jefferson, L. I.
Section No. 4. Headquarters, Montauk, L. I.
Section No. 5. Headquarters, West Sayville, L. I.
Section No. 6. Headquarters, Cropsey Avenue and Bay 17th Street, Bath Beach, Brooklyn, N. Y.
Section No. 7. Headquarters, Whitestone, L. I.
Section No. 8. Headquarters, Tompkinsville, S. I.
Section No. 9. Headquarters, same as Section No. 6.

The boundaries of these sections are given in a supplementary order as follows:

1. The Third Naval District extends from New London, Conn., to and including Barnegat, N. J.

2. This district is divided into nine sections, as follows:

Section No. 1. Headquarters, New Haven, Conn.

This section extends from New London, Conn., to Bridgeport, Conn., (exclusive). It includes the waters of Long Island Sound inside of a line from Goshen Point to Bartlett's Reef Light-vessel, from Bartlett's Reef Light-vessel through Cornfield Light-vessel to Stratford Shoal Light, from Stratford Shoal Light to Stratford Point Light and the Housatonic River. This section includes the following counties of Connecticut, and waters in same: New Haven, Middlesex and New London to the Thames River.

Section No. 2. Headquarters, Bridgeport, Conn.

This section includes the waters of Long Island Sound inside of a line from Stratford Point Light to Stratford Shoal Light, from Stratford Shoal Light to Execution Rocks Light, from Execution Rocks Light to East tangent of Huckleberry Island, from East tangent of Huckleberry Island to Westchester-Bronx boundary line. This section includes the following counties and waters (except Hudson River) in same: Westchester, N. Y., and Fairfield, Conn.

Section No. 3. Headquarters, Port Jefferson, L. I.

This section includes the waters of Long Island Sound inside of a line from Orient Point to Bartlett's Reef Light-vessel, from Bartlett's Reef Light-vessel to Stratford Shoal Light, from Stratford Shoal Light to Crane's Neck Point, Great Peconic Bay, and Little Peconic Bay. This section includes the following townships and waters in same: Brookhaven South to main line of Long Island Railroad; Riverhead, and Southold.

Section No. 4. Headquarters, Montauk, L. I.

This section includes the waters of the Atlantic Ocean West of a line true South from Montauk Point, and East of a line true South from Shinnecock Light. This section includes the following townships and waters in same: East Hampton and Southampton to Shinnecock Canal.

Section No. 5. Headquarters, West Sayville, L. I.

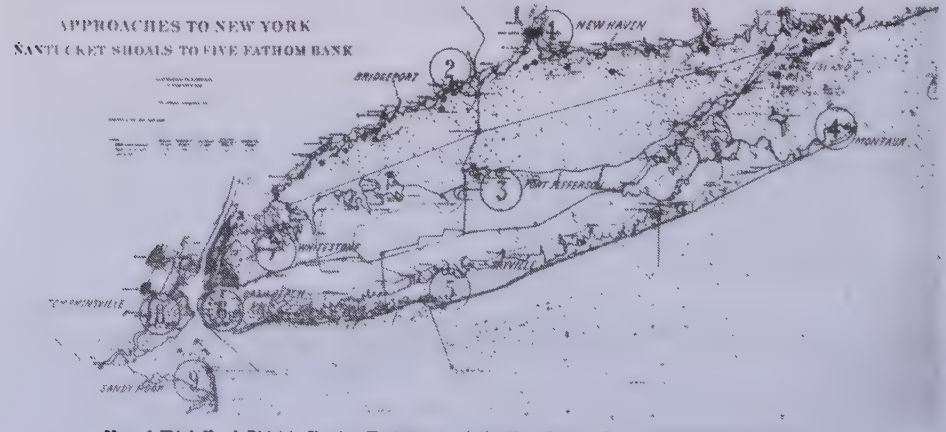
This section includes the waters of the Atlantic Ocean West of a line true South from Shinnecock Light to a line from Oak Island Coast Guard station to Fire Island Light-vessel. This section includes the following townships and waters in same: Southampton to Shinnecock Canal, Brookhaven North to main line of Long Island Railroad, Islip and Babylon.

Section No. 6. Headquarters, Cropsey Avenue & Bay 17th Street, Bath Beach, Brooklyn, N. Y.

This section includes the waters of the Atlantic Ocean West of a line from Oak Island Coast Guard Station to Fire Island Light-vessel, to a line from Norton Point Light to Ambrose Light-vessel; Gravesend Bay East of a line from Norton Point to Fort Lafayette; and Jamaica Bay. This section includes the following townships, counties, and waters in same: Oyster Bay North to Long Island Railroad, (at Bethpage); Hempstead, Queens County North to main line of Long Island Railroad; and Kings County.

Section No. 7. Headquarters, Whitestone, L. I.

This section includes the waters of Long Island Sound inside of a line from Crane's Neck Point to Stratford Shoal Light, from Stratford Shoal Light to Execution Rocks Light, from Execution Rocks Light to East tangent Huckleberry Island, from East tangent Huckleberry Island to Westchester-Bronx boundary line, and down the East River to a line true West from Newtown Creek. This section in-



Map of Third Naval District, Showing Headquarters of the Nine Sections Where Licenses May Be Obtained.

cludes the following townships, counties, and waters in same (except Hudson River): Whitestone, Huntington, Oyster Bay South to Long Island Railroad, (Bethpage); North Hampton, Queens County South to main line of Long Island Railroad; Bronx County.

Section No. 8. Headquarters, Tompkinsville, S. I.

This section includes the waters of the Upper and Lower New York Harbor, the waters inside of a line from Norton Point to Ambrose Light-vessel, from Ambrose Light-vessel to Sandy Hook Light; Raritan Bay, Kill von Kull, Arthur Kill, Newark Bay, Hudson River to New Jersey boundary line, and East River to Newtown Creek. This section includes the following counties and waters in same: Richmond, New York; Bergen, Hudson, Union, Middlesex and Essex, N. J.

Section No. 9. Headquarters, Cropsey Avenue & Bay 17th Street, Bath Beach, Brooklyn, N. Y.

This section includes the waters of the Atlantic Ocean South of a line true East from Sandy Hook Light, to a line true East from Barnegat. This section includes the following counties and inland waters in same: Monmouth and Ocean, to and including Barnegat, New Jersey.

3. A chart issued shows the limits of each section.

4. Sections 6 and 9 are combined, with Headquarters at Bay 17th Street and Cropsey Avenue, Bath Beach, Brooklyn, N. Y.

Classes in Navigation

The war and the demand for men to handle patrol boats and the coming demand for officers to handle the large fleet of cargo vessels now building, has stimulated the study of navigation and many of the yacht clubs are helping their members to learn how to handle their boats, to enable them to take complete charge of them and navigate offshore. The Hudson River division of the U. S. Power Squadrons has been very active in this work as, in fact, have all the divisions of the Power Squadrons. The men in the Power Squadrons make a close study of all nautical matters, and they must be qualified to handle their boats and to navigate before they can obtain certificates. The new class in navigation is held at the Hudson River Y. C. house at the foot of West 92d Street, New York. It is open to all citizens of the United States who care to make this study.

There is no tuition fee, and no expense except the cost of purchasing the necessary text-books. No obligation is incurred beyond agreeing to obey orders at the classes. Even attendance is not compulsory, but it is strongly urged that those who start in should finish the course. Competent navigators are conducting this class and when the course is finished those members who are able to pass the examination will receive certificates. The subjects covered are broad and fill every part of a seaman's duties. They include:

Personnel—General; ranks and ratings of enlisted men and officers; duties of officers and men; pay; naval customs; daily routine; drills; duties of those on water or lookout; uniforms and clothing; insignia of rank; things the men and officers of various ranks should know, etc.

Ships and Small Boats—General classes and characteristics; types; care and maintenance; types and uses; commands; under sail; under power; duties of boatkeepers, etc.

Seamanship and Piloting—Navigation laws, whistle signals, navigation in fog, lights, buoys and aids to navigation; compass, chart, navigation instruments; steering and boat handling; equipment, etc.



Ruita, a 32-Foot Niagara Runabout, Built For Percy A. Rockefeller; Speed 27 Miles With a Van Blarck 80-100-H.P. Engine

Signaling—Wigwag, blinker, semaphore, radio, flags, etc.

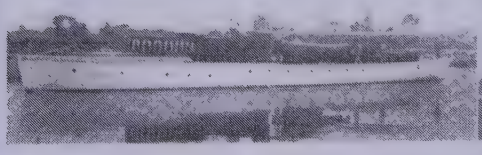
Dead reckoning and coastwise navigation.

First aid, swimming and life-saving, use of life-buoys, resuscitation.

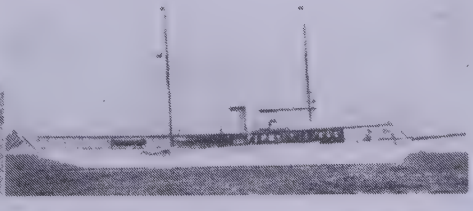
Deck Seamanship—Knots, splices, definition of sea terms, ground tackle, sails and spars, rigging, weather, storms.

Internal-combustion engines.

Practical boat handling.



Alacrity, 118-Foot Power Yacht, Loaned to U. S. Government by the Paine Webber Company; Fitted With Craig Engines



Monaloa, 137 Ft. Long, Loaned For Coast Defense Work by Henry R. Rea, of Pittsburgh; Driven by Speedway Engines

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Three Admirers of The Rudder

Editor of THE RUDDER:

Enclosed please find money order for renewal of my subscription to THE RUDDER. I have been a subscriber regularly since the last America Cup races, Shamrock-Reliance, and had noted with regret the gradual decline in the magazine. I am now very pleased to see that under the new management the tide has turned.

Queensland, Australia. CHARLES W. DEANS.

* * *

Editor of THE RUDDER:

I only took THE RUDDER occasionally under the old regime, but now that it has changed hands and is devoting more space for the edification of the true follower of the sport—the windjammer—I intend to become a constant subscriber.

South Australia. FRANK G. HICKS.

* * *

Editor of THE RUDDER:

We are in receipt of the last three numbers of your review containing such valuable information that we are requesting you to kindly deliver all 1916 numbers, as well as those published on January and February last.

Spain. ANTONIO CONDE, HIJOS.

The Flags of Y. C. Officers

Editor of THE RUDDER:

Will you kindly give me information about the following:

Are officers' flags of the yacht clubs standardized, or do most of the clubs establish their own designs?

If these are standardized, which is the standard design as adopted by the yacht clubs of the country?

What is the correct insignia on the coat sleeves and the caps of the officers of yacht clubs?

Washington. J. C. SAILS.

The officers' flags of yacht clubs are not standardized. The design of such flags is usually determined by the members of the club or by some committee appointed for that purpose. A number of the leading yacht clubs, however, have adopted one design. It is a foul anchor surrounded by thirteen stars, and the flag is rectangular in shape. The commodore's flag is blue, with the anchor and stars white; the vice-commodore's flag is red, with the anchor and stars white; and the rear-commodore's flag is white, with the anchor and stars red. Other clubs have generally adopted these colorings but have an individual flag, usually embodying some part of the club's burgee.

Some years ago the New York and a few other yacht clubs agreed on a uniform for members, and these clubs have really set the fashion. The cap device for yacht owners is two crossed foul anchors with flukes down embroidered in gold, at their intersection a raised disc bearing the club emblem. In addition to this, the commodore has three stars, one above and one on each side the device; the vice-commodore, two stars, one on each side, and the rear-commodore, one star above the device. The designation of rank on the sleeve is: commodore, five stripes of mohair braid ⅜ inch wide, the upper stripe ending in a described trefoil with a gilt star in each loop; vice-commodore, four stripes and two stars; rear-commodore, three stripes and one star; captains and other officers, two stripes; members, one stripe with trefoil. Ex-flag officers wear the stripes without the stars.

This idea is generally adopted by all clubs, with some variations. The club ornaments vary according to the rules of the club, but in all the sleeve ornaments designating rank are the same.

Chart Table

Editor of THE RUDDER:

In regattas, and particularly in cup races, the conditions will call for a race over a triangular course, each leg to measure four or more miles. The first leg, if possible, is laid to windward. Some regatta committees will signal only the compass direction of the first two legs of this course and leave the third leg to the navigators on the yachts. Of course the third leg is back to the starting point. The weather, however, may be hazy so that the home mark cannot be seen. Can you tell me how to figure the compass direction of the third leg? Suppose the first leg is East, 4 miles; the second leg South 36° West, 4 miles; what will be the third course and how can it be figured?

New York. RACING SKIPPER.

In all triangles the sum of the three angles is 180°. If the triangle is equilateral, each angle is 60°. Accordingly, the second leg will be 60° to the right or left of the reverse of the first leg, and the third leg 60° to the right or left of the reverse of the second leg.

If the first leg is East and the marks are to be left on the starboard hand, the second leg will be the reverse of East, or West + 60° South = S. 30° W.; the third leg will be the reverse of S. 30° W., or N. 30° E. + 60° West = N. 30° W.

In case it is not practicable to lay the course an equilateral triangle, the second leg is announced by the committee and, according as this is more or less than 60° from reverse of the first leg, allowance must be made in laying the third leg so that the sum of the three angles is 180°.

Your problem would work out as follows: First leg E.; second leg S. 36° W.; third leg N. 24° W.

Where the course is not equilateral, the third leg will not be the same distance as the other two.

Editor of THE RUDDER:

Will you kindly tell me how the hand-lead line is marked?

Providence. CURIOUS.

The lines are generally marked as follows:

2 fathoms from the lead, with two strips of leather.
3 fathoms from the lead, with three strips of leather.
5 fathoms from the lead, with a white rag.
7 fathoms from the lead, with a red rag.
10 fathoms from the lead, with a leather having a hole in it.
13 fathoms from the lead, same as at 3 fathoms.
15 fathoms from the lead, same as at 5 fathoms.
17 fathoms from the lead, same as at 7 fathoms.
20 fathoms from the lead, with two knots.
25 fathoms from the lead, with one knot.
30 fathoms from the lead, with three knots.
35 fathoms from the lead, with one knot.
40 fathoms from the lead, with four knots.

And so on. Fathoms which correspond with the depths marked are called marks; the intermediate fathoms are called deeps; the only fractions of a fathom used, are a half and a quarter.

Getting Bearings with a Boat Compass

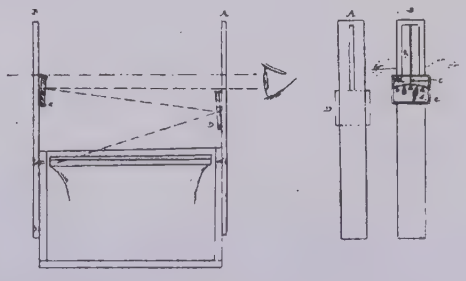
Warren Sheppard, who, in addition to being a very able artist, is a competent navigator, is now instructing students of navigation in the United States Nautical School which has been established by the U. S. Shipping Board and placed in charge of Henry Howard, of the Eastern Y. C. Some time ago Mr. Sheppard wrote several articles on Navigation which were published in THE RUDDER under the heading "Little Lessons." These articles attracted much attention from those interested in nautical matters. The following letter adds a little more to Mr. Sheppard's simple methods because of its simplicity.

Editor of THE RUDDER:

I have read with interest your article on Coasting in THE RUDDER. You refer to the method of getting bearings by means of a boat compass. Possibly you may not have tried my way, although I doubt if there is anything you haven't tried. At any rate, I will venture an explanation, as you may know of others who might like to try it. Of course it is crude for big boats that can use a pelorus. But I have used it with success on my own little yawl.

I have taken a spirit compass of two inches diameter (three might be better) and fastened carefully two sight vanes one with a narrow slit and one with a wide slit with a coarse wire down the middle. These should be adjusted on the box so that the line of sight is parallel to the line joining the center of the card with the further lubber line. I found it convenient to do this by means of a surveyor's compass, getting the bearing of a mark and then setting the vanes so that the compass box will show the same bearing.

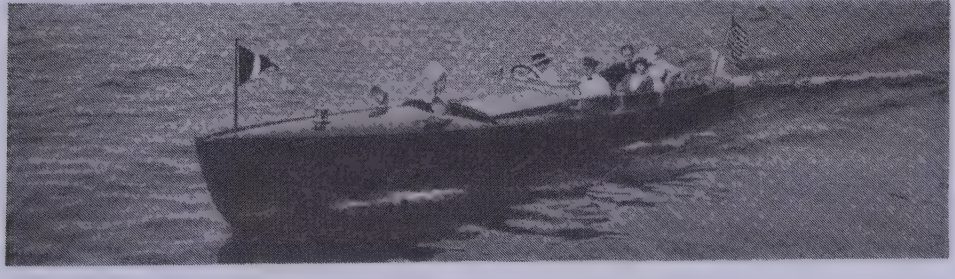
Two mirrors were then fastened to the vanes, as shown in the sketch. The object of these is to reflect the



part of the compass card and lubber line to the eye at the same time as the observer sees the object sighted at through the vanes. The mirrors are fastened into little brass boxes soldered onto the vanes at the correct angle. Necessarily, there is a change of focus in the eye when reading the bearing, but this does not bother one, as the distant object and the reflected card are so nearly in the same line of sight. The image is not inverted, and the points are read just as if there were no reflection. With this arrangement, crude as it is, one can watch the changing bearings with considerable accuracy.

Massachusetts. J. F. C.

P. S.—It is well to rotate the mirror C in azimuth so that the reflected lubber line E shall be continuous with the coarse wire of vane B.



An Elco Express Runabout—Ideal for Afternoon Trips

THE RUDDER

[Title Registered U. S. Pat Office]

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

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Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

Owner—Designer—Builder

The situation existing in yachting at the present time is without precedent; on the one hand, the yacht fleet has been depleted to a marked extent, and on the other all building has ceased for an indefinite time. The immediate cause of the destruction of the yacht fleet is the war, working in two different ways; in the power division a large number of the big yachts, with many smaller, have been taken for use as naval auxiliaries, a few of the sailing division sharing the same fate. The greatest loss of the sailing craft, however, is due to the high price of metals, especially lead. This condition was encountered in England early in 1915, many fine yachts being stripped of their copper, bronze and lead and the hulls sold for houseboats or left to rot; two years later the same stage has been reached on this side, some fifty yachts, including such craft as the 51-footer Aurora and the auxiliary yawl Scotia, having been reduced to mere hulks.

As to building, the outlook early in the season was that the unprecedented record of 1916 would be almost duplicated this year, many yachts being ordered and all yards being busy. The outbreak of the war not only stopped all building so far as yachting is concerned but created a new industry, of converting yachts into naval auxiliaries and of building the smaller classes of naval craft in the yacht yards. Thus far the yachtbuilders have had no cause for complaint, as all are fully occupied; many with special contracts for the new 110-foot submarine chasers and others with various sizes and types of patrol boats for private ownership to be given or loaned to the Government.

As no man may say how long the war is to continue, it is impossible to predict the exact conditions which will come into being with the advent of peace, but it is safe to predict that comparatively little will be left of the American yacht fleet, and also that there will be an immediate demand for the creation of a new fleet. Starting, so to speak, with a clean slate, it rests with yachtsmen, designers and builders together to decide what this fleet shall be.

* * *

On the part of the individual yachtsman, he should by this time know exactly what will best suit his needs; and as he pays the bills of both designer and builder he is entitled to the first voice in the matter. The yacht fleet of today is the result of a long course of evolution directed by chance rather than by deliberate study and systematic design. First came the old sailing cruiser, then the faster sailing type in which speed took precedence of the more sterling cruising qualities, then the steam yacht, the auxiliary sailing yacht, and last the modern power yacht. This latter, developed primarily from that miserable contraption, the "auto boat" of a dozen years back, and later corrupted in another direction by the craze for the imitation of naval types, reflects but little credit upon the good sense and discrimination of owners and the ability of designers, lacking most of the essentials of a pleasure vessel.

With the many examples of both good and bad design to be seen in every yachting port, and the general dissemination of popular as well as technical information in the yachting journals, it is within the power of any intelligent man who contemplates the building of a yacht to decide upon those qualifications as to size, speed and extent and character of the accommodation which will best suit his individual case. This much accomplished, he should be able to select a designer who will work honestly and intelligently to give him what he wants. It cannot be stated too strongly, for the benefit of the owner and of the designer as well, that the ideal yacht type is distinct from all other classes of vessel, having little in common with them. As to the perfect development of the type, the possibilities have never been as great as at the present time.

* * *

While the large steam yacht was developed in its day to a very high degree of perfection, it cannot be said that thus far designers have achieved any notable success in the new type propelled by internal-combustion engines which seems destined to replace it. The evidences of a serious study of the problem of the best form of hull for the modern power yacht of 50 to 200 feet length are not clearly discernible and, on the other hand, one sees everywhere the pernicious influence of the first crude "auto boats" with their ogee sterns, the hydroplanes with flat runs and square transoms, and the torpedo-boat and destroyer. It would seem as though the limit of absurdity and unsuitability had been reached in the imitation torpedo-boats and destroyers of the past three years, but if the wild vagaries of the recent past are truthful indications of the future of designing, we may look to see as the latest fashion in cruising yachts the imitation submarine, even more uncomfortable and unsuitable for yachting than the patrol-boat type.

* * *

In looking out primarily for his own selfish interests, the best thing that a yacht designer can do is to give his client a yacht which will so completely satisfy him as to keep him in yachting as long as possible, going successively into larger craft, and through his example making new converts to the sport. While on this subject, it may be proper to remark that it will be to the advantage of both owners and designers not merely to read but to study carefully the very sensible and plainly written article on "Seagoing Power Boats," by Mr. R. M. Haddock, in THE RUDDER for last month; bearing in mind that even the smaller power boats are certain to get all the sea they want at times, even in sheltered waters.

The problem of the builder has little in common with that of the owner or of the designer; his work is simply to construct from the designer's plans at a price that will

be profitable to himself and satisfactory to the owner. This work has become more difficult each year, as the cost of both material and labor has advanced while the builder has clung to the methods of his father and grandfather. A yacht should be the home of her owner, and, to be thoroughly satisfactory from this standpoint, she should possess the same individuality as the owner's clothing or his house on shore. Owing to the greater economy in space, in the yacht even more than in the house, every detail must conform to the special tastes and wishes of the owner. For this reason it is impossible to introduce manufacturing methods in yacht-building, each vessel being of necessity treated separately and apart, and constructed largely by hand labor.

Probably the best illustration that the world has yet witnessed of the possibilities of a perfect system of manufacturing is to be found in the Ford automobile, the increase in the rate of production with the decrease of cost and the improvement of quality within a few years being little less than marvelous. Similar though less notable results have been achieved in other automobile and some marine engine factories, and in these industries it is now generally recognized that success depends upon the perfection of the system.

The adaptation of such a system to yacht-building is an impossibility; the man who, without question, crowns himself with the conventional derby hat and drives contentedly in one of a thousand identical Packard cars or of a million Fords, would refuse to wear a uniform in civilian life, and he no longer lives in one of a mile of similar brownstone fronts but in the individual creation of an expert architect. Naturally he demands in his yacht the same distinctiveness and originality, both without and within, as characterize his house. At the same time there is no longer any reason why yacht-building as an industry should be notable from the exact opposites of all those modern methods which have brought success to other trades.

The planning and construction of a modern automobile or engine factory is a matter of serious study on the part of experts, but has anyone ever seen a well-arranged yacht yard or boat shop? Large and small alike, and regardless of the quality of their product, American yacht yards and boat shops are of the one type: a chance collection of buildings of all sorts and sizes huddled together at different times with no regard to convenience, the tools, even those of modern make, being thrown in on the same haphazard plan. The methods fit the plant, material is stored in confusion and too often used recklessly without regard to unnecessary waste, the work is so closely crowded that the men on one job interfere with those on the adjoining ones, the floors are littered with an accumulation of debris that delays the passage of workmen, the tools are inconveniently placed and under no system of care and direction; while one man is using a bandsaw or a planer two or three more are standing about idly waiting their turn. In the actual process of construction there is still too much hand work and general manual labor; the most modern tools for the conversion of material and apparatus for its rapid handling being perhaps less known in yacht-building than in any other similar industry.

There was a time when, with material cheap and plentiful and labor working long hours for low wages, the old system, or lack of system, was the best even from the standpoint of economy. In this era, with both wood and metal, even when not at war prices, dear and difficult to obtain, and with labor equally dear and scarce, the initial cost of a plant is a very small matter in comparison with the cost of producing the finished work. With the yards busy today and likely to continue so for some time to come, how many builders are running up makeshift shacks in inconvenient corners, building railways at a distance from the shops, installing tools of temporary rather than permanent utility; how many are deliberately planning such a reconstruction and reequipment of their entire plant as will make it possible to turn out better work at a lower cost and in a shorter time?

The question of the ideal plant for yacht-building, based upon the same general principles of economy and efficiency that are recognized as essential in automobile and engine manufacturing, is too big to be discussed here, but it is worthy of the immediate and serious consideration of every yachtbuilder.

* * *

James Simpson, who has tried for several years to win the Gold Challenge Cup with one of his family of Peter Pans, has the eighth member with which he will try this year. Simpson says he makes his "money in oats and spends it in boats;" but the Peter Pans are not the only ones he builds. He developed the Cinderella family, and his company, the Reliance Boat Company, has recently built a runabout which is named Bob-About, and a picture of which adorns the cover of THE RUDDER this month. This boat, 26 feet long, makes 36 miles an hour. It is driven by a four-cylinder, 6 by 6-inch Van Blerck engine. These boats are family boats but they can race too. Bob-About is owned by Julius Barnes, of Duluth, Minn.

* * *

About 30,000 women, enrolled as members of the National Special Aid Society, are doing much valuable work at the present time. To belong to this society costs from $1 for an annual member to $100 for a life membership, and the money so obtained is being spent judiciously to help where help is needed. Mrs. William Alexander is the president, Mrs. Charles Frederick Hoffman vice-president, and Mrs. Henry A. Wise Wood secretary. The board of directors is: Mrs. William Alexander, Mrs. John E. Alexandre, Mrs. William Allen Bartlett, Mrs. Charles H. Dittson, Miss Isabelle H. Hardie, Mrs. Charles F. Hoffman, Mrs. William W. Hoppin, Jr., Mrs. Franklin D. Pelton and Mrs. Eliot Butler Whiting. A no-food-waste committee, headed by Mrs. Eliot Butler Whiting, has devoted much time to teach how food should be saved, and met with much success. The society has raised money for aviation needs, encouraged enlistments, donated and fitted up a Naval Militia Hospital at Bayshore, knitted sweaters, gloves and mufflers for sailors and aviators, and much other work. What will particularly appeal to yachtsmen is the work it is doing for the sailors. Unfortunately, the equipment in the hospitals on the ships and the outfits for the sailors are almost nil, and this society is working hard to replenish these. The men on the warships and particularly on the mosquito fleet will need comforts this coming Winter and this society needs the help of all to furnish these things. The headquarters is at 250 Fifth Avenue, New York, where subscriptions may be sent.

* * *

Commodore James B. Ford's schooner yacht Katrina is the subject of the supplement of THE RUDDER this month. This favorite yacht is well known all along the Atlantic Coast for, while Commodore Ford makes his home port Larchmont, he cruises as far East as he can

go and is welcomed in every port he visits. The Katrina is the survivor of a class of yachts famous in the 80's. She was built by Henry Piepgras at City Island, in 1888, to race against the Titania and the Shamrock in the 70-foot class of sloops. Those three yachts took part in some wonderful races. Katrina was designed by A. Cary Smith. She is a steel vessel 86 feet 6 inches over all, 69 feet 6 inches on the water-line, 20 feet 2 inches breadth and 9 feet 4 inches draught of hull. She was changed from a sloop to a yawl in 1898, when owned by former Commodore Robert E. Tod, and in 1899 she was changed into a schooner. At one time when a sloop she was owned by Vice-Commodore George Work of the Larchmont Y. C. Katrina carries her years well. For nearly thirty years she has been in commission, and she can still show her heels to many of the more modern craft, and with a fresh breeze over the quarter she will sail away from the best.

The Navy Department recently asked for bids on a number of power and whale-boat hulls. These bids are published on another page of THE RUDDER and they show a most remarkable difference in prices. For a 24-foot whaleboat the prices quoted vary from $395 each to $4,393. It would seem that boatbuilders know very little of their own business. It is notorious that there is less efficiency in a boat shop than in any other factory. The boatbuilders seem to lack system and the amount of time wasted in one of these shops is appalling. To enable boatbuilders to figure intelligently, Charles Desmond recently prepared a set of estimate pads, copies of which were printed in THE RUDDER in the Quarter-deck department. He also wrote a book, "How to Run a Boat Shop," published by THE RUDDER, and if this book were studied and the estimate pads used by boat-builders there would be less chance of errors when bids are made.



Spokes from the Rudder Wheel

Colonel Cornelius Vanderbilt, former Commodore of the New York Y. C., has sold the sloop yacht Aurora to Frank A. Egan, of the New Rochelle Y. C. Aurora was built by Herreshoff in 1907 and, with Istalena and Winsome, made one of the best classes ever raced. In 1910 she won the Astor Cup for sloops and the King's Cup, and last year she won the Astor and Vice and Rear-Commodore's Cups.

* * *

The Bayles Shipyard, Inc., at Port Jefferson, is to be enlarged. The town trustees have granted a lease of land from low-water mark to a point 240 feet out in the harbor for twenty-five years, with the privilege of renewal. A sea-wall is to be built near the low-water mark and a plant is to be put up where steel and wooden vessels can be built. Work on the new building is now going on and the keels of new cargo vessels will be laid shortly.

* * *

The schooner Sea Fox, once the flagship of the New York Y. C., has been sold by former Commodore Dallas B. Pratt and is to be used for commercial purposes. Sea Fox was built in 1888 from designs by A. Cass Canfield who, at that time, was Commodore of the Seawanhaka-Corinthian Y. C. She is an iron vessel 115 feet over all, 85 feet on the water-line, 23 feet 11 inches breadth and 11 feet 6 inches draught. She was built by the Harlan & Hollingsworth Company at Wilmington, Del. She won the Goelet Cup for schooners off Newport in 1889, beating the Sachem, which was at that time the fastest schooner in these waters.

* * *

United States naval heroes are kept in the memories of all by the naming of certain vessels in the Navy. This is a custom all the world over, but in Britain the famous admirals are represented by the best fighting ships. Here the destroyers and the torpedo-boats bear the names of men to be honored, such as Lawrence, Farragut, Paul Jones, Decatur, Hull, Perry, Porter, and Sampson. Secretary of the Navy Daniels has recently announced the names of the destroyers now under construction. They are Little, McKee, Philip, Bell, Stevens, Stribling, Kimberly, Robinson, Murray, Wickes, Israel, Ringgold, Wooley, Sigourney, Stringham, Gridley, Evans, Gregory, Colhoun, Dyer, Harding, McKean, Fairfax and Taylor. Many of these, it will be remembered, took part in the Spanish War, such as Gridley, Dyer, Evans and Philip. Why was Admiral Dewey's name left out of the list?

* * *

Duncan Curry, Jr., son of Duncan Curry, yachting editor of the New York *American*, finished first in the competitive examination for Annapolis held in the First Congressional District of New York a few days ago and was appointed by Congressman Frederick C. Hicks. He passed the examination in 1916 when only fifteen years of age, but was a year too young to enter the Academy. This year he again took the examination, finished first and got the appointment. It is seldom that one so young passes the examinations for the Naval Academy, where the age limitations for admission are between sixteen and twenty years, and both father and son are to be congratulated on the ability and success of "junior".

* * *

The newly enlarged clubhouse of the Port Washington Y. C. was opened with a dinner on Saturday, July 21st. Commodore Arthur T. Vance presided. It was a most enjoyable affair. This club, the home of the Stars, is in a most flourishing condition and is growing fast. To help in the celebration George A. Cory, owner of Little Dipper, won the annual race to Captains Island and return the following day.

* * *

The shops of Rice Brothers at East Boothbay, Me., were burned down two weeks ago. Several boats were destroyed. One, a Government vessel, was got out of the yard with slight injuries.

* * *

Frank A. Small, a builder of schooners, died in Somerville, Mass., on June 22d, aged fifty-three years.

* * *

General David E. Austen, more popularly known as Colonel Austen because of his long association as commander of the 13th Regiment, N. G. N. Y., died at his daughter's home, Mountain Lakes, N. J., on July 16th. General Austen was for a long time secretary of the Atlantic Y. C. and served too as chairman of its regatta committee. Afterwards he was prominent in the Brooklyn Y. C. In both clubs he was active at times critical in their history and largely by his efforts their storms were weathered.

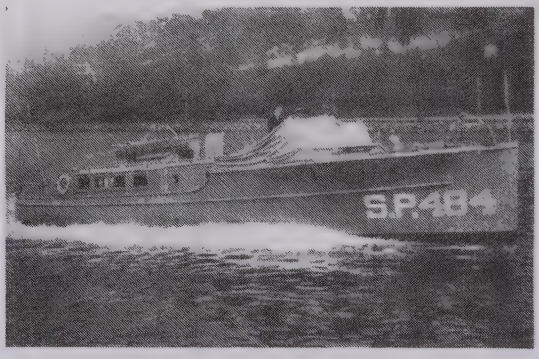
THE RUDDER

SEPTEMBER
1917

VOL. XXXIII-NO.9

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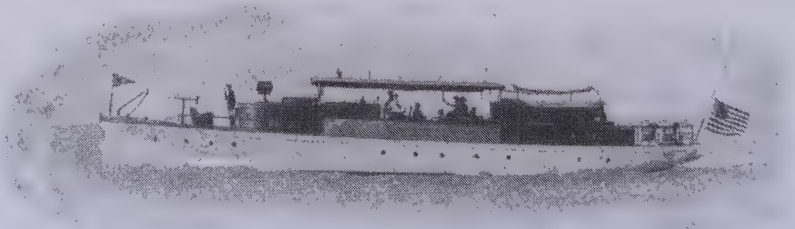
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A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | September, 1917 | No. 9

Miss Detroit II Wins Thousand Islands Cup

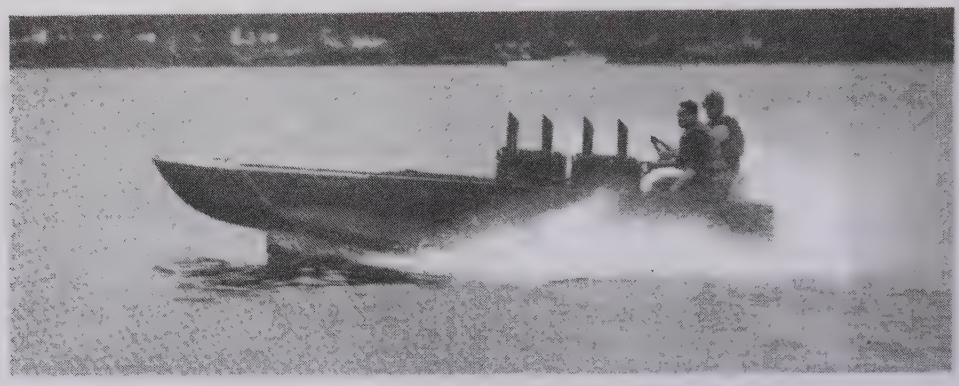
MISS DETROIT II, owned by G. A. Wood, of Detroit, an aspirant for Gold Cup honors, had little to do to win the Thousand Islands Cup, and her two races hardly showed the capabilities of the new Smith boat. She had to race over the 29-nautical-mile course on Alexandria Bay only twice, because a chapter of accidents steadily eliminated other starters. Three days of racing on the St. Lawrence had been planned, beginning on Wednesday, August 8th, and two events were on the program, the Thousand Islands Cup for hydroplanes and the *Herald* Trophy for displacement boats. The opening day was not the kind to race high-speed boats and so the first heat for the Thousand Islands Cup went over until the next day, but only two heats were necessary and the meeting was not extended beyond the three days. Thousand Island residents said that the rain and wind of that day furnished the worst storm of the season. The committee in charge of the racing was: G. C. Krusen, A. P. B. A.; C. F. Chapman, Lake George Club, and C. M. Englis, Thousand Islands Y. C. I. H. Jenny was timer, L. M. Rumsey measurer, and Commodore Charles Rees had charge of the course, which was patrolled well.

The *Herald* Trophy was for displacement boats. Six



Photo by Rotenfeld

Miss Detroit II, G. A. Wood, Owner, Winner of the Thousand Islands Cup and Challenger For the Gold Challenge Cup

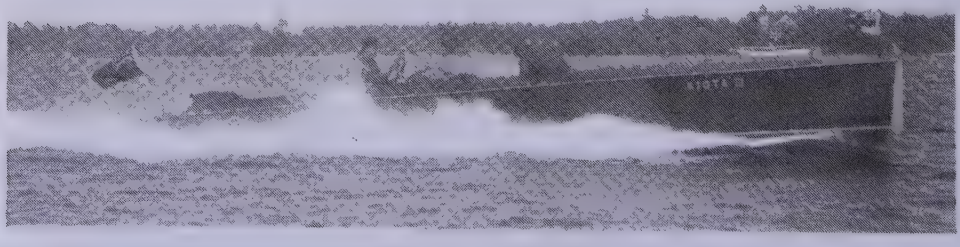


Peter Pan VIII, Simpson and Bickell, Owners, Whose Career Was Marred by Serious Accidents

entered but only four reached the starting line. These were: J. J. Harty's The Rat, from the Kingston Y. C.; R. S. Waldron's Kiota III, Kingston Y. C.; J. K. Hackett's Lady Rassendyl, Thousand Islands Y. C.; and James Simpson and J. P. Bickell's Miss Porcupine, Thousand Islands Y. C. Miss Q Too, owned by A. H. Quarrier, was held up in a broken lock on the canal and arrived too late to start, and Bickell and Clark's Leopard had engine trouble. The course was 29 nautical miles. Some misunderstanding at the start spoiled the chances of Kiota III and Miss Porcupine the first day. They started a minute too soon and consequently were not figured as having started until they had finished one round, and they had to continue on after the others had finished in order to qualify. The starting system consisted of the hoisting of four red balls, one of which was dropped 5 minutes before the starting gun, the second 4 minutes, the third 3 minutes, and the fourth one minute. A gun signaled the start. Miss Porcupine and Kiota III started one minute after the fourth ball had dropped. The Rat crossed 3 seconds after the gun and Lady Rassendyl was 19 seconds late. The Rat, running easily, held her lead for the three laps. Miss Porcupine broke a valve spring on the second lap and ran on three cylinders until John Hutchinson succeeded in making a temporary adjustment by the clever use of a screw driver. The Rat won the race by 7 minutes 56 seconds, with Lady Rassendyl second, Kiota III third, and Miss Porcupine fourth.

The hard luck which has been persistently following James Simpson in all his family of Peter Pans attacked the Cinderella family, of which Miss Porcupine is the latest member. Miss Porcupine got away well, followed by The Rat and Kiota III. James K. Hackett this time mistook the starting time. There had been a postponement of an hour on the first day and Mr. Hackett thought the time for starting was four o'clock instead of three o'clock. However, in spite of being very late, he sent Lady Rassendyl over the course on a long stern chase. Miss Porcupine ran well. She made her first round at the rate of 32.85 miles an hour, while The Rat averaged 31.2 miles, and Kiota III 27.7. On the second round Miss Porcupine averaged 33.2 miles an hour, Kiota III 32.5, and The Rat 31.2. When about 300 yards from the finishing line and having a lead of nearly a mile, Miss Porcupine stopped and had to be towed in. Her magneto had fallen off and she was helpless. The Rat won the race and on her last round averaged 31.25 miles an hour. The Rat beat Kiota 1 minute 43 seconds; Lady Rassendyl was third. On actual running time Lady Rassendyl had beaten Kiota III by 3 seconds.

The third race was won by Kiota III. She got away in the lead, making a beautiful start, followed by The



Kiota III, R. S. Waldron, Owner, Winner of One Heat and Second in the Series For the Herald Trophy For Displacement Boats



Rear-Commodore G. Allen Hayden on the Job With the Gun



Commodore Charles S. Rees, Thousand Islands Y. C.



Commodore A. L. Judson and G. A. Wood Watching the Boats

Rat, Lady Rassendyl and Miss Porcupine. At the end of the first round Kiota was leading with Miss Porcupine second 4 seconds astern. On the second round Miss Porcupine had another accident and withdrew. Kiota won the race by 3 minutes 16 seconds and Lady Rassendyl was second. The point score for the series was: The Rat 13, Kiota III 12, and Lady Rassendyl 11.

The races for the Thousand Islands Cup were over the same course. There were four starters: G. A. Wood's Miss Detroit II, A. L. Judson's Hawkeye II, Mrs. A. G. Miles's P. D. Q. IV, and Simpson and Bickell's Peter Pan VIII. At the time set for the start there was a strong wind and rough water, so a postponement was made for half an hour. Miss Detroit II was first away, followed by Peter Pan VIII, P. D. Q. IV and Hawkeye II. All started off well and Miss Detroit II jumped well into the lead, going the first round at the rate of 48.5 miles an hour. On this round Peter Pan VIII cracked three cylinders and retired. Although Miss Detroit's speed was slowed down after the mishap to Peter Pan, she steadily drew away from the others and she won the race, beating Hawkeye 3 minutes 55 seconds and P. D. Q. IV 12 minutes 50 seconds. Miss Detroit's speed for the 29 nautical miles was 44 miles an hour.

Hawkeye was unable to start in the second race. This left Miss Detroit II and P. D. Q. IV, and on second lap the latter broke her shaft. Miss Detroit II finished alone and was declared the winner of the cup and the



Alexandria Bay, Scene of the Recent Speed-Boat Races. Four Boats Starting in the Race For the Thousand Islands Cup



The Rat, J. J. Harty, Owner, Winner of the Herald Trophy



Lady Rassendyl, J. K. Hackett, Owner, Third in the Trophy Series

championship of the St. Lawrence. The times of each race and each lap are shown in the following:

THOUSAND ISLANDS CUP. Course 29 Nautical Miles

First Heat, August 9th

Boat	First Round M. S.	Second Round M. S.	Third Round M. S.	Elapsed Time M. S.
Miss Detroit II.....	13:54	14:57	16:18	45:09
Hawkeye II	14:35	16:43	17:46	49:04
P. D. Q. IV.....	18:56	19:15	19:48	57:59
Peter Pan VIII	.....	.....	.....	Disabled

Second Heat, August 10th

Miss Detroit II.....	16:01	16:23	16:42	49:06
P. D. Q. IV.....	18:15	.....	.....	Disabled

HERALD TROPHY, Displacement Boats. Course 29 Nautical Miles

First Heat, August 8th

The Rat	21:45	21:45	22:14	1:05:44
Lady Rassendyl	22:54	22:35	27:35	1:13:40
Kiota III	Not taken		.....	1:23:28
Miss Porcupine	Not taken		.....	1:35:17

Second Heat, August 9th

The Rat	21:21	21:21	21:40	1:03:35
Kiota III	24:07	20:31	20:40	1:05:18
Lady Rassendyl	*22:09	21:52	21:14	1:33:35
Miss Porcupine	20:17	20:08	.....	Disabled

Third Heat, August 10th

Kiota III	20:26	20:08	19:26	1:00:00
Lady Rassendyl	21:19	21:34	21:23	1:03:16
The Rat	21:14	21:14	21:26	1:03:54
Miss Porcupine	20:30	.....	.....	Disabled

*Started late; actual time.

Gardenia Wins Good Race

Commodore Harry Anderson's Gardenia won the *Herald* trophy in a race under the auspices of the A. P. B. A. on Long Island Sound on July 28th. A. F. Luders's Sentinel won a similar prize in a race under the auspices of the Long Island Power Boat Association. The race won by Gardenia was for cruisers rating over 38, and Sentinel's race was for cruisers under 38 rating. In the larger class the fastest time was made by B. E. Eldred's Romance. She made the fifty miles in 4 hours 42 minutes 45 seconds, but she had to allow time to all the other competitors, and on corrected time Gardenia, which finished third, won, with Melloise second and Romance third. There were five starters in this race. In the smaller class Victory II, owned by former Commodore Harry A. Jackson, finished first, but on corrected time Victory II had to take second place to Sentinel. There were seven starters in this event.

The course was from a line established a little to the Eastward of Huckleberry Island, thence to and around the Stratford Shoal Light and then to the finishing line, which was between the new and the old lighthouses at the head of Huntington Bay. The officials, on board the power cruiser Emoh III, sent the racers off promptly at ten o'clock. Twelve of the thirteen entered were on hand, H. Houpt's Topaz VII being the only absentee. Sparetime, owned by Z. Wilson, was the first to cross the line 5 seconds after the signal; she was lapped by Gardenia, and then



Mrs. McSherry, Miss Stella Wilbur, Miss Helen Eggleston and Miss Dolly Osborn, Collecting For the Red Cross From George Hasbrouck at Thousand Islands



Mrs. George Boldt, Jr., Mrs. A. G. Miles and Guests, Watching the Cup Races on the St. Lawrence River From Hart Island



Power Yachts Starting Off Whortleberry Island in Races For Herald Prizes, Under the Auspices of the Long Island Sound A. P. B. A.

came Sentinel, Helen B., Victory, Farad, Melloise, Heather, Kumalong, Romance, Luetta, all in close company. The Mary Ann was the only one severely handicapped at the start and she was 5 minutes late. The Emoh then got underway and at a fast clip gave chase to the racing yachts, soon overhauling them.

Romance, owned by B. E. Eldred, was the first to finish. She was followed by Melloise, Gardenia, Luetta and Helen B. in the order named in the class over 38. Romance had to allow Melloise 41 minutes 48 seconds and Gardenia 1 hour 19 minutes 15 seconds. She failed to overcome these handicaps and Gardenia won the race, beating Melloise 4 minutes 43 seconds and Romance 28 minutes 26 seconds, corrected time.

In the smaller class Victory II was the first to finish. Sentinel was next, beaten 20 minutes 10 seconds actual time, but Victory had to allow and on corrected time Sentinel won the race by 20 minutes 58 seconds. Victory II and Heather had a match race, which Victory won by 28 minutes 25 seconds. In addition to the two *Herald* prizes there were consolation prizes donated by former Commodore Harry A. Jackson.

Farad, owned by Charles F. Chapman, withdrew from the race and proceeded direct to Huntington Bay. On board Farad were Mr. and Mrs. Chapman and their infant daughter, who enjoyed the run resting in a tiny hammock swung in the cockpit. All the yachts anchored in Lloyds Harbor and those on board enjoyed a clambake, a proper finish to a day of good sport.



Gardenia, Commodore Harry Anderson, Owner, Winning the Herald Trophy; Length 50 Ft.; Built by Murray & Tregurtha, and Equipped With a 4-Cyl. Standard Engine

SUMMARY

CLASS A, Rating More Than 38. Start, 10:00 A. M.

Boat and Owner	Finish H. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Romance, B. E. Eldred.....	2:42:45	4:42:45	4:42:45
Melloise, H. G. Blanchard.....	3:00:50	5:00:50	4:19:02
Gardenia, H. Anderson.....	3:33:34	5:33:34	4:14:19
Luetta, W. E. Little	4:09:00	6:09:00	4:54:31
Helen B., W. Bagley.....	4:15:38	6:15:38	4:49:57

CLASS B, Rating Less Than 38. Start, 10:00 A. M.

Victory II, H. A. Jackson....	3:47:20	5:47:20	5:29:18
Sentinel, A. E. Luders	4:07:30	6:07:30	5:08:20
Heather, J. H. Wallace.....	4:12:40	6:12:40	5:57:43
Kumalong, E. S. Prince.....	4:19:52	6:19:52	6:19:52
Sparetime, Z. Wilson.....	4:27:05	6:27:05	6:20:58
Mary Ann, C. Lauten	4:32:12	6:32:12	6:12:02
Farad, C. F. Chapman.....	Did not finish.		

Anita Wins Long Race

George P. Granbery's Class P sloop Anita won the Stratford Shoal Race of the New Rochelle Y. C. The race was started on August 4th and eleven yachts competed. The start was made from a line at the entrance to Echo Bay, New Rochelle, and the course was to Stratford Shoal Light and return, a distance of 65 miles. E. H. Tucker, O. H. Chellborg and W. H. J. Ehler were the committee in charge and they used Commodore Marsland's power yacht Guardia, on which the signals were made. At the start the wind was very light from Northeast and because it was so light the start was postponed. It was 3:45 in the afternoon when they were sent away. The wind held true all through the race, that is, what there was of it, but for a long time the racers little more than drifted. Anita, a ghost in light weather, took a lead at once. Her class competitor was the Class R sloop Arvia. At the turning mark Anita had a lead of half an hour. Anita set a balloon jib and reached home a winner at 2:39:05 in the morning of August 5th. She was 56 minutes 20 seconds ahead of the Arvia and won the race by 8 minutes 38 seconds corrected time.

In the yawl class Feu Follet and Bonita withdrew early in the contest and J. C. Mitchell's Mediator finished alone, having sailed the course in 12 hours 22 minutes 8 seconds.

There were six starters in the Handicap Class. W. P. Krauss's Kenmuir led all the way and finished the course in 12 hours 30 minutes 20 seconds. A. J. Dealy's Ogeemah, although half an hour slower than the Kenmuir, won the race on corrected time by 14 minutes 11 seconds. Corny Shields sailed the interclub sloop Barbara to the finish. He was last home, but declared he had sailed one of the best races in his experience. The summary follows:

STRATFORD SHOAL RACE OF NEW ROCHELLE Y. C.

Course, 65 Miles. Start, Saturday, August 4th, 3:45 P. M.

RATING CLASS SLOOPS

Yacht and Owner	Finish Aug. 5, A. M. H. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Anita, G. P. Granbery	2:39:05	10:54:05	10:54:05
Arvia, T. S. Clarke	3:35:25	11:50:25	11:02:43

YAWL CLASS

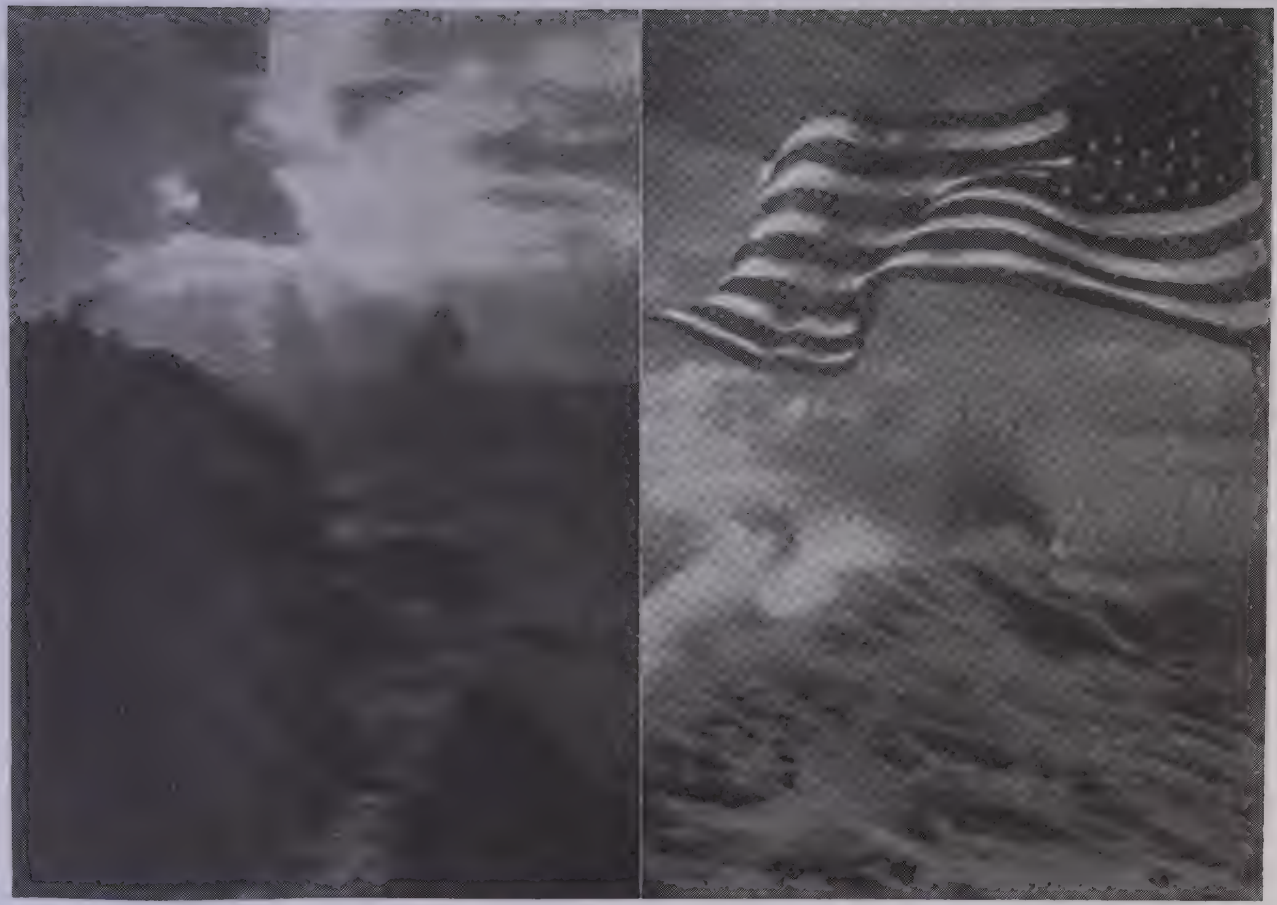
Mediator, J. C. Mitchell....	4:07:08	12:22:08	12:22:08
Feu Follet, O. J. Karsch ...	Did not finish.		
Bonita, S. G. Ellis	Did not finish.		

HANDICAP CLASS, SAILING IN ONE DIVISION

Kenmuir, W. P. Krauss ..	4:15:20	12:30:20	10:45:17
Ogeemah, A. J. Dealy.....	4:46:10	13:01:10	10:31:06
Clare, P. L. Pfeiffer	4:55:20	13:10:20	11:44:03
Red Wing, T. I. Grace	4:58:55	13:13:55	12:46:23
Acadian, F. E. Raymond....	5:00:30	13:15:30	11:37:57
Barbara, C. Shields	6:38:40	14:53:40	12:53:37



Start of the Race to Stratford Shoal and Return, Under the Auspices of the New Rochelle Y. C. George P. Granbery's Anita Was the Winner



Westward Ho! The Start of the Mayflower's Voyage, 1621
A Camera Fantasy and a Camera Fact by F. J. Mortimer, F. R. P. S.

Eastward Ho! The Return of the Man of the Mayflower, 1917

Reproduced from The Graphic

South Jersey Racing

By J. Kinzer Shell, Jr.

HAVING the majority of the racing boats competing, representatives of the Chelsea Y. C. captured premier honors in the second race-meet of the South Jersey Yacht Racing Association, held over the course of the Ocean City Y. C. on Little Egg Harbor Bay on July 21st. The Chelsea boats were hard pressed by those of the Ocean City Y. C. for firsts, but the seconds and third captured by the Chelsea boats greatly aided them in piling up a big lead on the other clubs. Chelsea boats won three of the seven events, while Ocean City took three, and the other went to Atlantic City. Six of the seven second places were taken by boats flying the burgee of the Chelsea Club.

The winners of the eight events are as follows:

Open Boats, Rating Under 40, Course 6 Nautical Miles. Nadine, B. G. Frazier, Chelsea Y. C.

Open Boats, Rating 40 to 60, Course, 12 Nautical Miles. Foggy Dew, J. L. Appleton, Chelsea Y. C.

Open Boats, Rating Over 60, Course 12 Nautical Miles. Sara Jean, C. W. Gana, Chelsea Y. C.

Cruisers, Rating Under 40, Course 6 Nautical Miles. Delphine, A. C. Reed, Atlantic City Y. C.

Cruisers, Rating Over 40, Course 12 Nautical Miles. Laureba, Harry D. Le Cato, Ocean City Y. C.

Express Cruisers, Course 18 Nautical Miles. Mary Jane, James M. Rowland, Ocean City Y. C.

Displacement Racers, Course 18 Nautical Miles. J. M. R., James M. Rowland, Ocean City Y. C.

One-Design Catboat Interclub Contest, Course 6 Nautical Miles. Fiddler, Orville Crane, Atlantic City Y. C.

Displaying a consistency of speed, the Mary Jane, owned by James M. Rowland, of Ocean City, easily won the express cruiser contest over the 18-nautical-mile course. She covered the distance in 17 seconds over an hour and ran away from the Sarah Jane, owned by W. C. Handlan, of the Chelsea Y. C. The Ocean City craft allowed the competitor from Chelsea 3 minutes 33 seconds time allowance and overcame the handicap, winning on corrected time by 2 minutes 54 seconds. She was 6 minutes 27 seconds faster than the Sarah Jane, which, while a handsome-looking express cruiser, was too heavy and long to make speed.

Captain Rowland had the honor of being the only double winner of the day, for, after capturing leading honors in the express cruiser event, he saw his displacement racer, the J. M. R., outdistance the Baby Nymph, owned by Louis C. Eisenlohr, of the Corinthian Y. C. of Cape May, in an 18-nautical-mile contest. The J. M. R. had an easy time in overtaking the new speedster from Cape May, which raced for the first time with a new engine and new wheel. She was forced to slow down on each of the turns. This action was not altogether to blame for her being beaten for on the first lap she broke down for five minutes, and in that time the J. M. R. had made up the handicap and was well on her way to the finish of the initial lap before the Baby Nymph again got going.

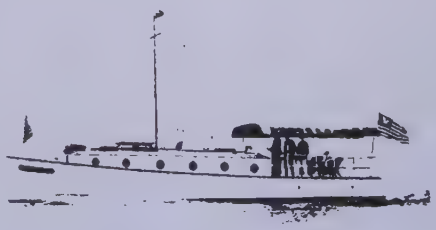
The J. M. R. covered the 18 nautical miles in 41 minutes 32 seconds, while the Baby Nymph did the distance in 51 minutes 43 seconds.

One of the disappointing features of the regatta to the sporting instincts of the follower of the game was the manner in which the cruiser, Laureba, owned by Harry D. Le Cato, of the home club, raced with the Peggy, owned by former Commodore Samuel W. Whan, of the Chelsea Y. C., in the event for boats rating over 40. The Peggy, allowing the Laureba 11 minutes 58 seconds time allowance in the 12-mile contest, had no trouble in overtaking the Ocean City craft on the first lap. After getting on even terms with the local boat the Peggy had all she could do to keep alongside. After turning the last buoy and a hundred yards from home, the Laureba was apparently beaten. To the surprise of all, the Laureba put on an extra burst of speed and won by a close margin of 8 seconds. It has always been the idea of power-boat enthusiasts to have the boats in the several classes show their best despite the handicaps and the unevenness of the time allowances. This the Laureba did not do, but waited for the Peggy to catch her in order to give the spectators an interesting race.

It did not take long for the representatives of the Chelsea Y. C. to demonstrate to the thousand spectators who crowded the verandas, docks and bulkheading of the Ocean City Y. C., that they were there when it came to open boat competition. The three races went to the visiting yachtsmen, who cleaned up also in second places. In the lower class of cruisers, the Delphine, owned by A. C. Reed, of Atlantic City, had an easy time winning from the Margeth, owned by J. N. Bower, of Chelsea.

It remained for the skippers of the Atlantic City Y. C. to give the regatta the proper touch by winning the first of the interclub series of sailboat races for the one-design catboats. The sailors of the greatest shore resort in the country stepped right out in front in the 6-nautical-mile race. Led by Orville Crane aboard his boat The Fiddler, the Atlantic City fleet made a clean sweep of the contest, winning the first five places. The Logan, owned by Alexander Lawrence, Jr., of the home club, was the first of the contenders to cross the finish line, being in the sixth position.

Due to the activities of war and the necessity to prevent any interference with naval and aviation work



Delphine, A. C. Reed, Owner, Winner in the Small Class of Cruisers

at Cape May, the third race-meet of the series of the South Jersey Yacht Racing Association, on Saturday, August 4th, was called off. Morton R. Alexander, chairman of the regatta committee of the Corinthian Y. C. of Cape May, after conferring with the naval and aviation officials, decided to cancel the regatta and notified the other clubs of the Association of the action.

The summary of the events is as follows:

OPEN BOATS, Rating Under 40. Course, 6 Nautical Miles

Boat and Owner	Allowance M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Nadine, B. G. Frazier	4:53	56:07	51:14
Pet, G. C. J. Fleck	3:13	54:33	51:20
Lounge, H. W. Allen	3:05	59:14	56:09
Luegeo II, G. F. Fish	Scratch.	56:17	56:17
Coyote, W. Wolf	5:39	1:09:56	1:04:17

OPEN BOATS, Rating 40 to 60. Course, 12 Nautical Miles

Foggy Dew, J. L. Appleton	Scratch.	51:41	51:41
Seamohr, F. C. Rollman	10:27	1:12:55	1:02:28
Etta, J. L. Fritz	1:32	1:15:40	1:14:08
Chanticleer, H. L. Appleton	4:44	1:27:59	1:23:15

OPEN BOATS, Rating Over 60. Course, 12 Nautical Miles

Sara Jean, C. W. Gana	Scratch.	45:19	45:19
Shick, J. F. McCall	3:45	59:45	56:00
M. S. R., G. L. Rogers	:16	Broke down.	

CRUISERS, Rating Under 40. Course, 6 Nautical Miles

Delphine, A. C. Reed	:28	40:03	39:35
Margeth, J. N. Bower	3:58	45:35	41:37
Aloha, G. M. Milspaugh	4:19	47:52	43:33
Bubble, G. L. Markland	9:18	53:09	43:51
Gertrude, S. N. Wilson	4:12	49:31	45:19
German, J. H. Gessler	4:33	Broke down.	

CRUISERS, Rating Over 40. Course, 12 Nautical Miles

Laureba, H. D. Le Cato	11:58	1:27:41	1:15:43
Peggy, S. W. Whan	Scratch.	1:15:51	1:15:51
Margama, G. L. Rogers	7:36	Out.	

EXPRESS CRUISERS. Course, 18 Nautical Miles

Mary Jane, J. M. Rowland	:42	1:00:17	59:35
Sarah Jane, W. C. Handlan	4:15	1:06:44	1:02:29

DISPLACEMENT RACERS. Course, 18 Nautical Miles

J. M. R., J. M. Rowland	Scratch.	41:32	41:32
Baby Nymph, Louis Eisenlohr	3:07	51:43	48:36

ONE-DESIGN CATBOATS. Interclub. Distance, 6 Nautical Miles

Boat and Owner	Elap. Time H. M. S.
Fiddler, Orville Crane	1:16:58
Suds, Frank Sprow	1:18:25
Sea Maid, F. Parker	1:18:43
Uncle Sam, T. McCorkle	1:18:59
Alert, B. McNulty	1:19:02
Logan, A. Lawrence	1:21:38
Blue Streak, J. White, Jr.	1:22:10
Pollyanna, C. F. Wall	1:22:51
Lu Lu, Bassett & Fite	1:23:58
Saucy Kate, S. Wood	1:25:54
Zip, W. D. Bonsal	1:25:54
Pollywag, Mary White	1:28:10
Scat, C. White	1:26:36

Delaware River Cruiser Championship

Displaying a consistency of speed and running with and against the tide without a semblance of trouble, the Pickaninny, owned by Bell and Taylor, of the Camden M. B. C., came into her own in power-boat competition on the Delaware River, when she won the Delaware River Cruiser championship held under the auspices of the Delaware River Y. R. A. from the anchorage of the Keystone Y. C. of Tacony. The Pickaninny, with a time allowance of 1 hour 39 seconds, was a winner by 11 minutes 53 seconds over the Laureda, owned by A. A. Jordan, of the Keystone Y. C., on corrected time in the 55-nautical-mile contest, which started and finished at the Keystone Club, and had its turning point at Hollyoak, Del.

Although finishing well down in the list, in sixth position, the Helma, owned by William Fredericks, of the United B. C. of Wilmington, won the time prize by the narrow margin of 10 seconds from the Eva Dor, owned by J. A. Robbins, of the Riverside Y. C. But for an infraction of the rules the Eva Dor would have finished in second position and would have obtained the second time prize. According to the racing instructions she had to pass the buoy just below Tacony to starboard, which she failed to do, thus disqualifying herself from the contest.

The prettiest race of the entire fleet of nine boats resulted between the Helma and the Eva Dor, which were the first across the finish line. The fleet was sent away together from the starting line, the time allowances being deducted from the elapsed times after the conclusion of the contest. The Eva Dor got across the line with the rest of the fleet with the Helma losing three minutes at the start due to engine trouble.

The Eva Dor led the fleet to the turning point at Hollyoak with the Helma but a minute behind. The two boats were well up-river before the last of the bunch had rounded the turning point for the trip home. The Helma had a hard time on the final 27½ nautical miles to catch the Eva Dor. Just below Bridesburg the Wilmington craft was on even terms with the Eva Dor, only to lose ground when the river steamer Dolphin, after leaving her dock for the final run up-river to Trenton, got in the way of the racing boats, which were traveling in the channel. After getting out of the mess the best they could the two boats encountered a tug which again interfered with them. The distance from the finish line was short but it was sufficient to give the Helma the narrow margin of victory.

While the race was held under the new 1917 rules and regulations of the A. P. B. A., which tends to eliminate the low rated boat from obtaining such a big leeway in competition, there was sufficient evidence in the contest to warrant saying that it was not primarily a success. The Pickaninny, the winner, is a middle class boat, as also the Laureda, which finished second. But the Isabella IV and the Clio, which finished third and fourth respectively, are low raters. The conditions for the contest, which calls for good rough weather, was anything but ideal, the waters being calm and like a lake throughout the contest. For this reason the Clio, the smallest and lowest rated boat of the fleet, was able to traverse the course with comparative ease and to show her best. She robbed the higher rated boats, which are capable of good work in a heavy sea, out of deserving positions. If the course had been according to specifications, the Clio no doubt would have finished well down in the contest.

Since the holding of the contest there has been quite a deal of talk relative to the disqualification of three of the boats that entered the events. In the first place the Helen T., owned by former Commodore Charles Townsend, of the Wissinoming Y. C., was not allowed to compete due to not having enough bulkheading over the engine. Then the Jennie S., owned by George Stock, of the same club, was fired out of the race for being owned by a professional. She could not even be taken out under an amateur crew, which she has done on

former occasions. Then again the Eva Dor, owned by J. A. Robbins, of the Riverside Y. C., was disqualified for cutting the course shortly after the start. It has since developed that a majority of the boats, according to reports, cut the course and did not keep to the channel according to the rules. This would mean that the other boats in the majority of cases would be disqualified.

The summary:

Boat and Owner	Allowance H. M. S.	Elapsed Time H. M. S.	Corrected Time H. M. S.
Pickaninny, Bell and Taylor....	1:00:39	6:52:43	5:52:04
Laureda, A. A. Jordan	52:51	6:56:48	6:03:57
Isabella IV, B. Hay	1:27:43	7:44:13	6:16:30
Clio, H. L. Jarvis.	2:00:26	8:22:50	6:22:24
Berthela, J. Broomhead.....	1:38:35	8:08:10	6:29:35
Helma, W. Fredericks	Scratch.	6:30:50	6:30:50
Sue M, C. A. Morrell	15:32	7:17:06	7:01:34
Acushla, W. O'Donnell	12:52	7:35:09	7:22:17
Eva Dor, J. A. Robbins	33:43	6:31:00	*5:57:17

*Disqualified not passing Bridesburg buoy to starboard going down river.

Barnegat Bay Racing

Despite the fact that the annual Barnegat Bay Y. R. A. championship power-boat regatta, due to a misunderstanding, was called off, there was plenty of good competition for the sailboats of the several types in the annual affair held over the course of the Seaside Park Y. C. It was a return to the old days when the windjammers raced over the waters of Barnegat Bay in keen contests for historic trophies.

The center of attraction was the competition for the Sewell Cup, which is raced for annually by the catboats of the one-design type over a course 10 miles in duration. The Island Heights Y. C. took the cup home for a year when the Virginia, owned and piloted by Dr. Carlile, won over the Peerless, owned and sailed by S. Boswell, of the same club. The Virginia had a handicap of 1 minute 28 seconds on the Dorothy, owned by F. P. Larkins of the Seaside Park Y. C., and finished the race in 2 hours 36 minutes 44 seconds. She beat the Peerless by one second less than 13 minutes on elapsed time and over 11 minutes corrected time.

Captain J. R. Such, of the Mantoloking Y. C., won the men's sneakbox contest of the Association with his boat, the Frolic. Mrs. Frank Schofield, of the Island Heights Y. C., was the winner of the women's sneakbox contest, sailed over a course 6 nautical miles in length.

With a Northerly wind blowing across the ruffled waters of the Bay in the morning the regatta committee changed the course of the women's race. Shortly after the boats, four in number, all having skippers of the fairer sex aboard, got away for the run, the breeze shifted to Eastward, giving the yachts a reach over the better part of the course. Miss Rosalie Hall, flying the burgee of the Mantoloking Y. C. aboard her sneakbox, the Picaroon, got across the line first and had a good lead over the other boats. Despite the big handicap, the other boats slowly crawled up on the leader and after the completion of half the course the four boats were well together. Miss Elizabeth Brakely, on the Skibo, of Bay Head, overtook Miss Hall. On the reach from Coates Point back to the finish line the Vanite, piloted by Miss Edith Murphy, and the Resolute closed up on the two leading boats. A short distance from the finish line, Mrs. Schofield took the lead from the Skibo, crossing the line first by 38 seconds. Miss Murphy was a minute behind the Skibo, while Miss Hall finished fourth.

Changing of tides and the vagaries of the breeze had the men's skippers in their sneakbox contest guessing, although they traversed the short triangular course in the proximity of the clubhouse. The boats, of which there were seven, went around the course four times. Five of the boats answered the starting gun, but the Wren and the Picaroon crossed the line two minutes late. The course selected gave plenty of windward work. Shortly after the start the Frolic, the fourth boat away, picked up on the leaders, rounded the buoy on the first lap in third place, went around the buoy in second place on the second lap, and continued in that position to the finish, her time allowance of 6 seconds standing her in good stead, giving her the victory over the U. I., owned by J. L. Pennock, of the Seaside Park Y. C., by 5 seconds on corrected time.

Pennock, aboard his U. I., held the lead for the first two laps, but on the third lap he stood in too far and grounded on the flats. He managed to get off in time to overtake the fleet on the final lap, but his time allowance was not sufficent to give him first place, although finishing in second position.

In the only power-boat contest held, an exhibition between two express cruisers, the Echo, owned by William Stenger, of Seaside Park Y. C., given 20 seconds allowance in an 8-nautical-mile chase, by the Fame, owned by William Badenkoff, of Island Heights, won by the narrow margin of 18 seconds.

The summary of the races is as follows:

WOMEN'S SNEAKBOX RACE. 6 Miles

Boat, Owner and Club	Elapsed Time H. M. S.	Corrected Time H. M. S.
Resolute, Mrs. Frank Schofield, Island Heights	52:34	52:33
Skibo, Miss E. Brakely, Bay Head.....	54:11	54:11
Vanite, Miss Edith Murphy, Island Heights..	55:18	55:15
Picaroon, Miss R. Hall, Mantoloking	57:01	56:56

RACE FOR SNEAKBOXES. 10 Miles

Frolic, J. R. Such, Mantoloking	2:31:54	2:31:48
U. I., J. L. Pennock, Seaside Park.....	2:31:57	2:31:53
Vanite, Ralph Patterson, Island Heights.....	2:33:15	2:33:13
Skibo, Miss E. Brakely, Bay Head...	2:33:26	2:33:26
Wren, F. F. Bailey, Bay Head	2:37:36	2:37:31
Resolute, F. E. Schofield, Island Heights....	2:37:32	2:37:31
Picaroon, John White, Mantoloking	2:38:50	2:38:43

SEWELL CUP RACE FOR CATBOATS. 10 Miles

Virginia, Dr. Carlile, Island Heights.....	2:36:44	2:35:16
Peerless, S. Boswell, Island Heights.....	2:49:43	2:44:37
Dorothy, F. P. Larkins, Seaside Park.....	2:51:45	2:51:45

EXPRESS CRUISER, Match Race. 8 Miles

	El. Time M. S.
Echo, Wm. Stenger, Seaside Park	28:17
Fame. Wm. Badenkoff, Island Heights.....	28:25



One-Design Catboats at Barnegat

Race Week at Put-in-Bay

NO regatta in the country furnishes more good sport or more good fellowship each Summer than that of the Inter-Lake Yachting Association at Put-in-Bay. The Inter-Lake Association comprises all the yacht clubs on Lake Erie, Lake St. Clair and the Detroit River. There are twenty-three clubs in the association and as each club is always represented in some way at this week of racing, it can easily be figured that the fleet of racing craft is quite large and the number of cruisers is also large, so that the limitations of the harbor at Put-in-Bay are taxed.

The fleet of racing craft ranges in size from tiny catboats and dories to cruising sloops, and the best classes are Q and R. The owners or their friends sail these boats and the sport is strictly on an amateur basis; professionalism is unknown. The contests are hard fought out and the interest is keen. After the races are over and the winners for the day known, the yachtsmen, like yachtsmen of other localities, talk things over, figure just how they won or lost and prepare in their minds for the races the next day. So it is too with the power boats. The fleet is large and representative and the racing is very keen. Hydroplanes, displacement boats and cruisers take part in these events.

But the racing is not all that takes place at Put-in-Bay. There are dinners and dances, entertainments and receptions, band concerts on the flagship and smaller affairs on the smaller yachts. So is it any wonder that this annual week is popular or that the yachtsmen will strain every point to be on hand when the fleet gathers?

Commodore Alexander Winton is the leader of the Inter-Lake Association and he arrived at Put-in-Bay on board his yacht La Belle and had on board H. D. Freeman, of Columbus, O.; C. D. Lynch, of Detroit; G. H. Gardner, of Cleveland; Henry J. Gielow, of New York, and Earl H. Croft. Commodore Harry A. Parsons, of the Cleveland Y. C., was on his cruiser Mahapa, with Bob Powers, who sails the Pam. Commodore Charles W. Kotcher, with his Betty M, was anxious to race anything. Carl G. Fisher, the moving spirit at Miami, paid some attention to details, looking for new wrinkles. Then among the many others on hand were Commodore Alec McLeod, Detroit Y. C., who won races with his cruiser Francis A. V; Commodore W. E. Bock, Toledo Y. C., who had a new Elco express named Emeline; Percy C. Jones, who was much interested in the Star sloop Forty-Four; Charles E. Greening, Monroe Y. C., who raced his Smith speed boat Baby Rambler and won; Carl Faladeau, of the Maumee River Y. C.; F. Zimmerman, Jr., Cleveland Y. C.; J. R. Ballantine, Riverside B. C.; William F. Meier, who, as chairman of the Power Boat Committee, had lots of work to do and did it well; Commodore C. Lee Abell, Buffalo Y. C., who acted as timer; F. B. Smith, Cleveland Y. C., also on the committee; L. A. Alexander, Maumee River Y. C.; W. R. Huntington, owner of the Class R sloop Mebleh, also of Cleveland; C. B. Lockwood, C. N. Kendrick, owner of the Class Q yacht Gray Jacket; M. R. Clissold, owner of the Class Q sloop Chaperon; Commodore W. J. Gunnell, of Buffalo, and hosts of others.

The power-boat racing began promptly at 2:30 p. m. on Monday, July 16th. The first races were under the A. P. B. A. rules, but the sport that day was somewhat marred by one of the ugly Lake Erie squalls, which necessitated shortening the courses. Open boats rating over 50 were started first. There were four in this class: Commodore Harry A. Parsons's Gray V, R. Hackett's Spray, R. Metzger's Shoes Too, and R. Sims's Cleo III. Gray V is a new boat, the first of a one-design class building for members of the Cleveland Y. C. She is 29 feet 6 inches long and 4 feet 8 inches breadth. A six-cylinder, 4¾ by 5½-inch Duesenberg engine drives the boat very fast and Gray V outclassed her rivals for honors. Commodore Parsons drove the boat himself. Incidentally she is used as a tender for his cruiser Mahapa II. Gray V's time for ten miles was 35 minutes 46 seconds. She finished nearly 17 minutes ahead of Shoes Too. On corrected time Gray V beat Spray 3 minutes 30 seconds and Shoes Too 3 minutes 57 seconds; Cleo III did not finish.

In the class for boats under 50 rating three started. Carl Faladeau's Faladeau finished first but on corrected time J. R. Ballantine's Cosy won by 1 minute 30 seconds. Faladeau was second and H. C. Brinker's Flora third.

There were two starters in the class for hydroplanes. Charles E. Greening, of the Monroe Y. C., won with Baby Rambler, built by Chris Smith, a 26-foot runabout now in her third season. This boat is driven by a Van Blerck engine. Her only competitor was an Elco express named Emeline and owned by Commodore W. E. Bock, of Toledo. Baby Rambler finished the ten miles in 27 minutes 10 seconds and won very easily. Emeline's time was 35 minutes 44 seconds.

Commodore C. W. Kotcher, who is always on hand to help the racing even when he has a poor chance of success, started Betty M II the second day against F. Zimmerman's Aquilon II. A match race over a 15-mile course was arranged and Betty M II defeated Aquilon II 11 minutes 56 seconds elapsed time, and 40 seconds corrected time.

Cruisers raced on the second day. In Class F 40 to 60 feet Commodore Alec McLeod won with Francis A. V, P. Frederick's Neptune was second and George Marsh's Princess was third. In Class E there were six starters. Mary Belle, owned by W. F. Meier, chairman of the Power Boat Committee, won by 38 seconds corrected time. E. L. Myers's Hilda finished first, but on account of the handicap was relegated to second place, while F. B. Frank's Bertga II was third.

On the third day the open boats and hydroplanes raced on a handicap fixed on their performances on the first day. The boats took their handicaps at the start, so that they might finish in close company, but the handicaps did not work well. In the race for open boats under 50 rating Merriweather, owned by Paul Watkins, had a big start and the others could not

catch her; H. C. Brinker's Flora was second, Carl Faladeau's Faladeau third and J. R. Ballantine's Cosy fourth. In the race for boats over 50 rating Gray V had to allow lots of time. She covered the fifteen miles in 46 minutes 11 seconds, but could not catch Spray or Jay-Cee, Spray winning the race. In the hydroplane class Emeline got off with a big handicap allowance and held the lead to the finish. Baby Rambler, starting last, gained second position; Billiken, owned by W. H. Millspaugh, was third, and Amerigo, owned by Max Stotter, fourth.

The power-boat racing ended on Thursday, July 19th. The cruisers of Class G over 60 feet raced twice, one being a postponed event. Commodore H. A. Parsons's Mahapa II won each time, defeating W. R. Huntington's Thelma first by 5 minutes 16 seconds and then by 6 minutes 58 seconds. Commodore McLeod won in Class F with his Matthews-built yacht Francis A. V, easily defeating Neptune, Princess and Olie May. In the smaller division of cruisers Viola H, owned by J. F. Hauser; W. F. Meier's Mary Belle won again by a small margin from E. L. Myers's Hilda. Betty M II won in the express cruisers race, as Aquilon II broke her steering gear

The committee did much figuring after the races and announced the winners of the prizes as follows:

Class A, Open Boats Rating Under 50.—Faladeau, Carl Faladeau, Maumee River Y. C., first; Cosy, J. R. Ballantine, Riverside B. C., second.

Class B, Open Boats Rating Over 50.—Spray, R. Hackett, Del Ray Y. C., first; Gray V, Commodore Harry A. Parsons, Cleveland Y. C., second.

Class D, Hydroplanes.—Baby Rambler, Chas. E. Greening, Monroe Y. C., first; Emeline, W. E. Bock, Toledo Y. C., second.

Class E, Cruisers Under 40 *Feet.*—Mary Belle, W. F. Meier, first; Virginia, T. A. Devilbis, second; Hilda, E. L. Myers, third.

Class F, Cruisers 40 *to* 60 *Feet.*—Francis A. V, Alec. McLeod, Detroit Y. C., first; Neptune, P. Frederick, second; Princess, George Marsh, third.

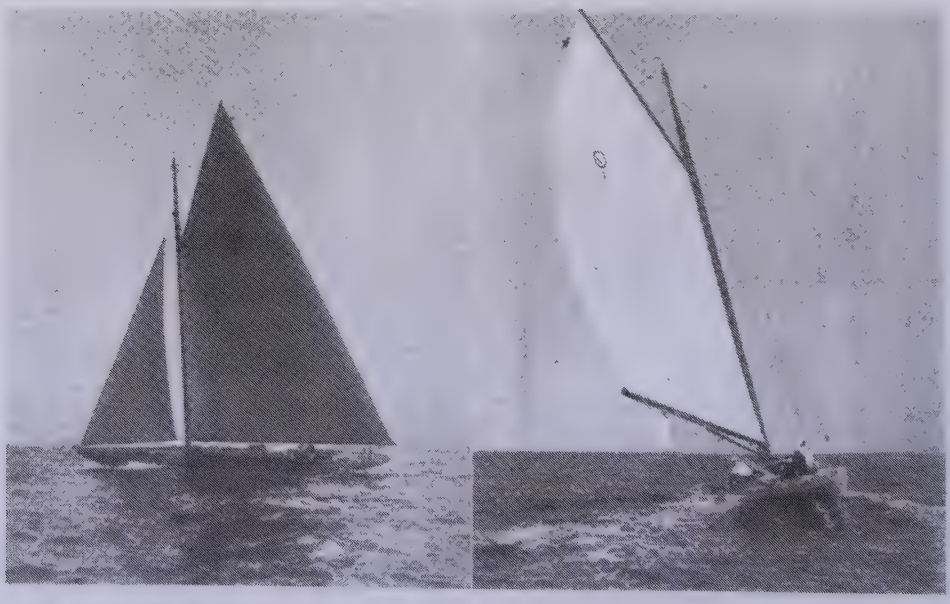
Class G, Cruisers Over 60 *Feet.*—Mahapa II, Commodore H. A. Parsons, Cleveland Y. C., first; Thelma, W. R. Huntington, second.

Class H, Express Cruisers.—Betty M II, Commodore C. W. Kotcher, Detroit Y. C., first; Aquilon II, F. Zimmerman, Jr., Cleveland Y. C., second.

One accident happened which came very near marring the week of sport. After the finish on Wednesday Commodore Greening left for Detroit and the crew of Baby Rambler started out for a little spin. The engine back-fired, setting fire to the hull, which was burned badly, the upper portion of the hull being destroyed. Several boats ran to the rescue of those on board and saved them from serious injury. The boat was towed to dock.

The sailing yachts raced in the morning, starting at nine o'clock, while the power craft held the program each afternoon. The sailing yachts began their racing on Tuesday, July 17th, and a fleet of twenty-nine completed the courses, while several small boats were unable to finish because the wind was so light and the time limit expired.

Interest centered in Class R, in which there were six starters. These were the two Gielow boats, Clarice and Spook II; the Alden boat Pam, champion of last year; the Owen boat Mebleh; the Purdon boat Psammiad, and the Bowes & Mower boat Neahga. They started in a fresh breeze which, however, soon died out and the racers drifted over the course. Mebleh



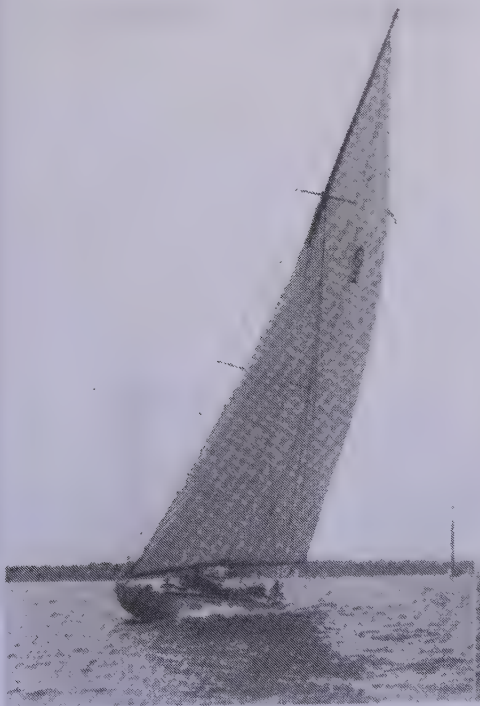
Georgia, H. H. Raymond and Frank Strachan, Owners, and Nimbus (Right), Joseph F. Feder, Owner, Two of the New Larchmont 38-Foot Class Sloops

found a light air later and worked into the lead, while Clarice and Pam were becalmed. Pam found a wind near the second mark and she finished second to Mebleh, with Clarice third. Mebleh took 3 hours 53 minutes 51 seconds to sail the nine miles.

In the Q Class were three boats that were at one time popular on Long Island Sound and Gravesend Bay. Gray Jacket won the race, with Spider second and Chaperon third. Only two of the once famous 21-footers started, and Diabolo beat Jackson Park 1 hour 11 minutes. In the race for cruisers Chewink IV defeated Elsie 16 minutes 15 seconds, corrected time. Alladin won the race for 19-footers; Oriole III was the winner in the 16-foot class, and in the Stars Shadow, owned and sailed by George King, of Toledo, won handily. Polaris, sailed by L. A. Alexander, of the Maumee River Y. C., was second, beaten 2½ minutes; Percy H. Jones was third in the Forty-Four.

Clarice, owned by Commodore Alex. Winton, won a fast race on Wednesday, the third day of the meeting, defeating Spook by 1 minute 6 seconds. There were six starters, all owned in the Cleveland Y. C., and only 4 minutes 49 seconds separated the first and last. Gray Jacket won in the Q Class by 49 seconds from Chaperon. Spider was disqualified for turning a wrong mark. Jackson Park won in the 21-foot class; Chewink IV was the winner in the cruisers class; Fudge won the race for 18-footers; Ingomede that for 16-footers. The Detroit Y. C. captured first honors in the dory and catboat classes; Shadow was the winner in the Star Class and Forty-Four was second.

In the final events on July 20th, Chaperon won in Class Q with Spider second. Mebleh won in Class R, with Clarice second; Chewink IV won in the cruiser class, Fudge in the 18-foot class, Oriole III in the 16-foot class, and Shadow in the Star Class. The last event of the week was a race from Put-in-Bay to the mouth of the Maumee River. There were eight starters and Spider, of the Toledo Y. C., won; Elsie, of the same club, was second, Mebleh third, and Psammiad fourth. The other starters were Pam, Clarice, Neagha and Nokomis.



Varuna, Commodore James B. Ford, L. Y. C., Owner, Carrying the Marconi Rig



Grey Dawn, Philip H. Johnson, Owner, Carrying a Gaff Mainsail

Two-Cycle Troubles

By Charles A. Starr

THERE is such a responsive chord which vibrates within me every time I see a fellow cranking his two-cycle engine by the half-hour—and it is no uncommon sight wherever there are boats and "bugs"—that I feel like repeating the advice contained in the legend of a little card which fell into my hands a few years ago: "Don't Swear at Your Motor—Learn to Run It." Also I remember hot and weary hours when your humble servant also toiled over the flywheel and if he didn't swear it was not for lack of either motive or desire. Likewise I remember a certain sage remark of a student of the gas engine: "What's the use o' crankin', ef she ain't 'goin' to run?"

I submit that is real philosophy, combined with an accuracy of grasp of conditions; but I do not for a minute think that volumes of advice and columns of rules would ever make the average boatman change his ways. Can a leopard change his spots? Well, I should say not.

But there may be some men, not of the average, who have two-cycle engines which peeve them at times, who may read and heed what is written for their edification and help.

When I appealed to H. Clifford Brokaw, principal of the Motor Boat School of the West Side Y. M. C. A. in New York City, for some ways to detect and remedy two-cycle engine troubles, however, I was nonplused when he replied:

"The trouble with two-cycle engines is that they do not have a lot of parts to go wrong like the four-cycle; so when anything is the trouble with them you never know where to look for trouble."

It is true that there are no valves to stick or to leak and thus spoil the compression or prevent the piston from sucking in a charge of gas, but in every other way the two-cycle engine can give the four-cycle a long lead and come out ahead on trouble, and if there be no cam shafts and push rods and splash, gravity or force-feed oiling systems to go wrong, there are leaks from loose bearings which upset the whole mixture; there are leaky pet or priming cocks which blast the compression; and there are all the ignition and carbureter troubles, and the gas pipe line is just as likely to become clogged—but this is not a list of troubles; it is an attempt to solve them.

When the motor in your cruiser
Will not motor as it ought ter;
Gives an absolute refuser
To go sailing through the water—
What's a feller goin' to do, sir?
Can the pesky thing be taught ter?

The most common trouble of the two-cycle engine is the loss of base compression, which renders it impossible to get a charge of gas into the combustion chamber at all, or regularly. This is due in large part to worn main bearings which allow air to suck in instead of the gas mixture. In two-cylinder engines, sometimes, the center bearing will become heated and wear, and there will be suction back and forth between the two bases. Now you are trying, when you turn over a two-cycle engine of this type, to create a vacuum in one base so that gas will draw in, and to make compression in the other so that gas will pass into the combustion chamber. Similarly in one combustion chamber there is the intake suction and compression, and in the other the firing under compression and then discharge of the burned gas in time to admit a fresh charge. With an open center bearing the operations are neutralized.

Very much on the same order is the leaky check valve, especially of the horizontal type. The stem becomes worn and the valve does not seat properly. It lets the gas in, but does not close quickly enough on account of kinking and part of the charge passes back. It makes a lean charge and the engine coughs. The remedy is obvious—a replacement of worn parts.

But that cranking. Of course, sometimes the switch is not turned on, or there may be something wrong with the ignition, or with the carbureter, or something else, but usually when all these are set straight and the engine will not start no matter how much it is cranked, the trouble is that the base is flooded. Cranking has drawn the mixture into the base in deep draughts and it has not been burned, and while some of it is expelled through the exhaust, more of it condenses and gathers in the base. The result is a mixture which is so rich it will not fire. This is the condition under which most of the cranking is done. As a matter of fact the more cranking done in the ordinary way the worse the situation becomes, for the flood in the base rises.

My engine has a drain pipe from each cylinder base, with a pet-cock which comes out just under the flywheel, so that I can draw off the excess gas; but most engines do not have this and it is necessary to get rid of the flood in another way. One must shut off the further flow of gas through the intake manifold, open the pet, or relief, or priming cocks, or all of them, and crank the engine with the spark on until the gas is all burned out.

There is just one danger about draining off the gasolene in the base. Some two-cycle engines require a slight supply of lubricating oil in the base to keep the crank bearings oiled. Even some engines which take in lubricating oil with the gas need a bit of splash in the crank case or the bearings will not last long. And, if the oil is drawn off and there is no way of replacing it, there is danger of burning out the bearings before there is a sufficient accumulation drawn in with the mixture. Theoretically, the oil fed with the gas lubricates the cylinder and crank and wrist-pin bearings; practically, most two-cycle engines require a slight splash in addition.

When the engine wants to cough
Then there is not gas enough;
If of gas there is too much,
She will never turn the clutch.

Another trouble which usually puzzles the novice comes from carbon collecting on the intake side of the baffle plate. This is from excess lubrication or from

a too rich mixture which does not fully burn. After the engine has been running a little while the carbon becomes red hot, causes preignition, and then there are explosions in the base. Sometimes by running the engine idle with a very lean mixture the carbon will be dislodged or burned out, but it is likely to get in the muffler and clog that in time, so that it is best to take off the cylinder head, or the cylinder, if the head is not removable, and scrape the carbon off the baffle plate and upper part of the combustion chamber.

If the wheel does not want to turn around after the engine has been standing for several days, usually it is a sign that the pistons are "frozen" in the cylinder, which means that the lubricating oil supplied was not in sufficient quantity and burned out, or that the cooling was inefficient and the cylinder walls were so hot that the oil dried up after the engine was stopped. Of course, the cylinders are much hotter a few minutes after the engine is stopped than before, since the water circulation stops when the engine does and the water in the cooling chamber becomes very hot. But usually the "freezing" is a sign that the cooling system is not working perfectly; either the pump does not deliver a full pressure or there is a clogging somewhere—perhaps a gasket partly closes one of the openings.

There is another trouble due to irregular cooling which is not always so easy to detect. On a two-cycle, two-cylinder engine sometimes it seems impossible to make the carbureter work. It may be adjusted to supply either cylinder so that it fires perfectly, but simply will not adjust to fire both. Usually this is because of the uneven temperature of the cylinders. It is particularly true when the engine is installed at a sharp angle, so that the cold water flows the more readily to the second cylinder because of the incline. The trouble may be overcome by regulating the inflow of cold water to that cylinder. This may be done by putting on a gasket with a smaller opening, so that it will restrict the flow. A little experimenting will give an even temperature to both cylinders and the carbureter trouble will disappear.

In the make-and-break type of ignition, after the engine has been run for some time the igniters become worn or out of adjustment and do not fire in the same relative time. One of them will break before the piston reaches top center. It makes the engine jump and vibrate badly and is an exceedingly hard thing to locate, unless one has had experience. Of course it is easy to adjust when the trouble is located.

It should be remembered by the owner of a make-and-break engine that if one of the plugs is short-circuited the engine will not start. With a jump-spark engine the distributor sends an independent current to each plug, but not so with the make-and-break; the current seeks the line of least resistance and where there is a circuit established through a short in one plug, it is not going to spark when the igniter points part in another cylinder. It is wise, therefore, if the engine will not start and there is a spark, showing that battery and coil and switch are working, to try a wire on each plug in turn, thus locating the faulty one.

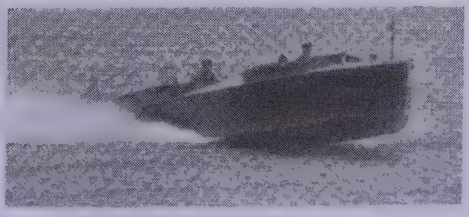
You must have a lot of current
Running through the proper wires;
And, if you would breast the current
See that each igniter fires.

Very often, in filing the contact points of a make-and-break igniter, the novice will get them round at the point of contact, so that there is not a good surface where they come together. The ignition process is that of making a contact and then breaking it. It is at the time of breaking that the spark occurs, and if there has not been a good circuit established through the points the spark at the break will be too weak to ignite the charge of gas. A good contact is as necessary as a positive break, or there is too much resistance for a good spark. Again this is different from a jump-spark, where the resistance builds up a hotter spark.

Right here let me add that the owner of a make-and-break engine need not get excited over the advertisements of so-called energizers or spark gaps warranted to give a hot spark and save gasolene. They will not work on a make-and-break.

The make-and-break igniter has two principal parts, termed hammer and anvil. No, they have no relation to the anvil chorus you hear about every club. The hammer is the movable part, operated by a mechanical device outside the cylinder. The anvil is the fixed part, or plug, which is insulated from the block or part of the igniter which is fastened to the cylinder. Sometimes the hammer sticks so that it will not close or open the circuit. Also, sometimes, it becomes worn where it passes through the igniter block and thus allows the escape of compressed gas, even so much as to spoil the compression. The entire igniter is bolted on the cylinder, having either a ground joint or a gasket to make it tight, but a tiny piece of dirt or other cause may produce a leak at this joint and spoil the compression. They generally show this by oil being forced out around the joint.

The external plunger which operates the hammer may stick in the guides because gummed up or rusted, because of lack of lubrication, or because of the igniter being out of alignment. This causes the points to remain open or closed. Springs whose purpose is to



Whistler, Lawrence P. Percival, Owner; 50 Ft. Long; Built From Designs by S. H. Brown, Jr., by J. E. Graves; 300-H.P. Sterling Engine; Speed 23 M.P.H.



Mouser III, 40-Foot Runabout, Owned by Senator G. F. Harding, Chicago, Which Makes 40 M.P.H. Driven by a 400-H.P. Van Blerck Engine

open or close the points, or to operate a trip dog, may lose their tension through heat or rust and not operate properly, therefore it is wise to inspect them occasionally.

The hammer and the mechanism which operates it must be kept well lubricated at all times, but care should be taken that there is not a lot of oil all over the parts, for it collects dust and soon will cause a short-circuit, or loss of current, and the igniter will not do good work. Most igniters, likewise, should not be enameled at all, for oil and enamel soon produce a short-circuit, or at least a path through which part of the juice escapes.

On a make-and-break engine the hammer
Is a much-needed part of the game;
But no chorus you hear, from the anvil, my dear,
But 'tis needed aboard, just the same.

The best way to clean the insulation of the igniter is to use a stiff brush with kerosene or gasolene, removing all carbon or soot. Do not take the insulater apart. It is made up of rings or washers of mica, highly compressed and polished. If once taken apart it is impossible to get them together tight again, or to get them together so that the surface will be smooth as it was originally, and carbon will collect in the interstices between the washers, giving trouble again quickly. Neither should the mica insulation be scraped or filed, for either would roughen the surface, making a fine place for carbon to collect.

Until one learns his engine pretty well, probably it will be wise to clean the igniter points of carbon each time the engine is started up. It is very hard to start if they are covered with carbon, and as generally an engine is run idle or very slow just before stopping at the end of a trip, carbon collects very rapidly. Some owners speed up the engine for a minute or two before closing it off wholly, to burn off any carbon collection, but this does not always work, and if there is trouble in starting it would be better at once to look at the igniter points. My Barker engine is especially prone to this trouble if I try to run it throttled down, though the engine will run hour after hour without a sign of carbon trouble when speeded up with throttle half open or more.

I cannot refrain from repeating a story told me by Principal Brokaw, who used to run a boat. It has nothing to do with an engine, two-cycle, or otherwise, but it may have value for some boatmen: When starting off on a rather long trip Mr. Brokaw was uncertain where he would find an ice supply, so he determined to preserve what he started out with as long as possible. Therefore, he wrapped it carefully in several thicknesses of nice piper. It was a great success in keeping the ice, so great that the ice-box became hot, the butter wanted to run away and the provender almost spoiled before discovery. And Mr. Brokaw learned from practical experience one of the laws of physics, that you can't eat your cake and have it, too—no, that you can't cool your ice-box and keep your ice. If you wrap your ice in an ice blanket, or in paper, therefore, leave at least one side uncovered to melt, or the liquid and other refreshments will be warm, though right alongside the cake of ice.



Captain George W. Scott (Standing) Entertaining Mr. and Mrs. George W. Schonolk, of Holland, on Board His Schooner Yacht Miladi

Wings for Our Airmen

FROM the special attraction at country fairs, where everyone for miles around flocked to see an airman loop the loop and fly during a gale and with the expectation of seeing him dashed to the ground at almost any moment, American aviation has at last reached a state of recognized importance.

But for our entrance into the great world war our aviation would probably still be in the thriller class; for we as a people have never taken the aeroplane seriously as have the leading powers of the world. Until the beginning of the present year we were easily five years behind other nations in the matter of aeronautics. Once, however, that we were told by our new allies that the war could be speedily brought to a victorious consummation if we were to send tens of thousands of machines and airmen to Europe, American aviation received public and official recognition. Now we are rushing through plans for an aerial armada which, when realized, will place us in the first rank among the air fleets of the world, or at least among the leaders.

The present world war, although the most destructive of all time, has had a most beneficial effect in the progress of aviation. Indeed, it is safe to assume that in the ordinary course of things it would have required ten years at least for aviation to reach its present perfection; but the armies engaged in this war have demanded and received the best that aircraft designers and builders could supply, and the brains of every country engaged have been busily applied to turning out machines, with every facility at their command.

Fortunately for us, the Allies have placed their latest data at our disposal, so that the United States begins her air fleet at a point reached by other nations that have spent almost a decade in developing their air forces, as well as three years in a most trying and frightful war. And given the benefit of this experience and constant development, our problem resolves itself into one of production, which, while vast and intricate, should be readily solved by a nation that is renowned for its industrial achievements.

An aeroplane consists essentially of a body built up of wooden members and covered with fabric; a pair of wings and a tail, consisting of light woodwork covered with fabric; an engine of light weight yet as reliable as the average automobile engine; and a propeller made of a number of pieces of choice wood, glued and bolted together and carved to the proper shape. Aside from the engine, the production of aeroplanes is largely a matter of fine carpentry.

There are two classes of engines used on aeroplanes—the rotary and the stationary types. The rotary engine is one in which the cylinders and crank case revolve while the crank shaft remains stationary, and one of the main advantages of this type is its exceptionally light weight. The stationary engine, on the other hand, is similar to conventional automobile or marine practice, and is usually water-cooled. While somewhat heavier than the rotary type for a given horsepower, it has been developed to a point where it is considered more suitable for heavier machines where reliability is an all-important requirement. The rotary engine, weighing a trifle over 2 lb to the horsepower in models up to 100 h.p., has of late been applied mostly to scouts and the faster battleplanes, where its light weight makes for speed; and as a further advantage the rotary engine is claimed to have a greater climbing power than the stationary type, which also makes it more suitable for this class



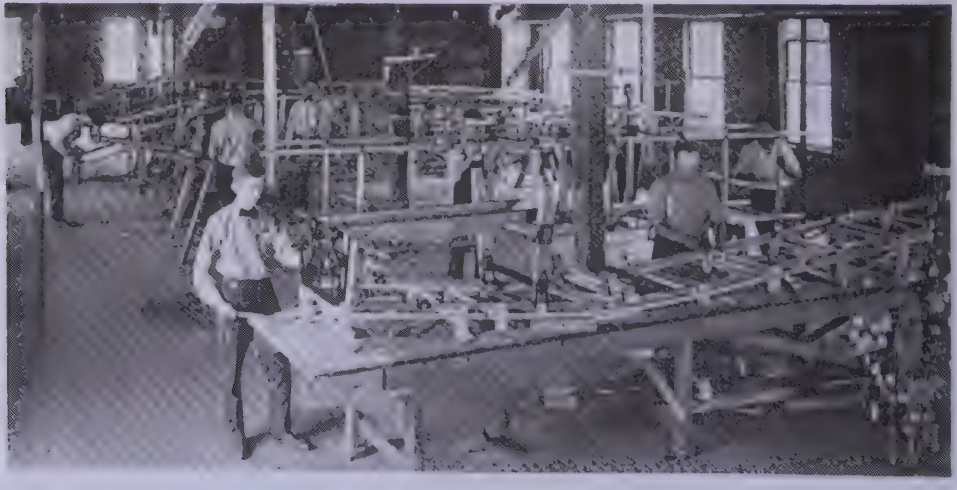
College Men Training to Be Aviators. Hauling in Aerial Coast Patrol No. 3 After a Successful Flight



Setting Up the Frames of the Fuselages or Bodies, Showing the Lightness of the Construction © Brown & Downes

of service. The stationary engine, on the other hand, can be built in larger horsepowers—engines of 300 h.p. are being built—and despite its weight, which usually ranges between 3 and 4 lb to the horsepower, its greater reliability makes it more suitable for large battleplanes, bombing machines and reconnaissance machines, whose function is to operate far into enemy country where engine failure means either destruction or certain capture.

Several excellent types of aeroplane engines are being made in this country today, representing the rotary and stationary practice. Of the former it is interesting to learn that a Long Island City concern, whose normal business is the manufacture of electric



© Brown & Downes

Setting Up the Bodies, Which Are Made of Spruce or Ash. The Planking Is Mahogany About 3/16 In. Thick, Which Is Filled and Varnished



© Brown & Dawson

The Body Taking Shape, Showing the Gasolene Tanks in Position and the Aviator's Seat. The Construction Is Light but Very Strong

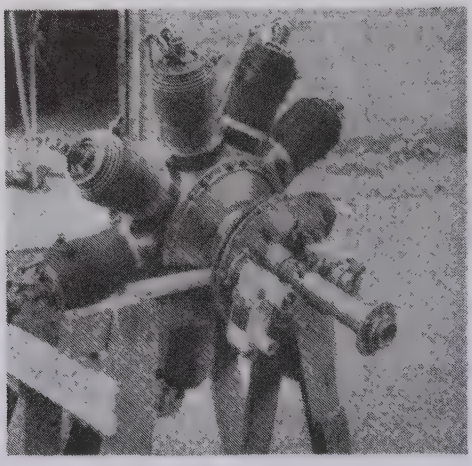
vehicles, has turned to the manufacture of the famous Gnome engine. Today this concern is turning out rotary engines which are said to be as perfect as their French brothers and far ahead of their British brothers. This engine represents the most difficult undertaking in machine work, for every part must be turned out from solid metal. The cylinders, as an example, weigh 95 lb in the rough forging, and in their finished form weigh a trifle over 5 lb, the difference in weight being the metal removed in machining operations.

Of the stationary types, we are now turning out several makes which compare well with those of European manufacture, among them the American-made Hispano-Suiza engine, which is considered the last word in aviation engine design. Recently a leading manufacturer of cars constructed a 300-h.p. aviation engine, and exhaustive tests proved this engine to be as fine a piece of work as any in existence. Still another, a maker of gasolene tractors, built a sixteen-cylinder aviation engine, which also passed the

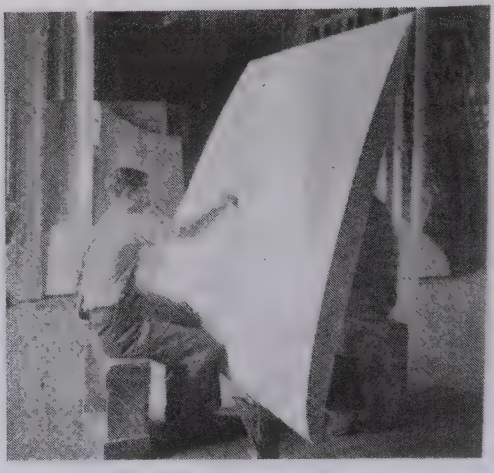


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Assembling, Which Consists of Erecting First the Fuselage or Body and Then Installing Seats and Controls, Tanks and Instruments. After the Engine Is Mounted the Body Is Covered



© Brown & Dawson
The Gnome Rotary Engine, Now Being Built in This Country



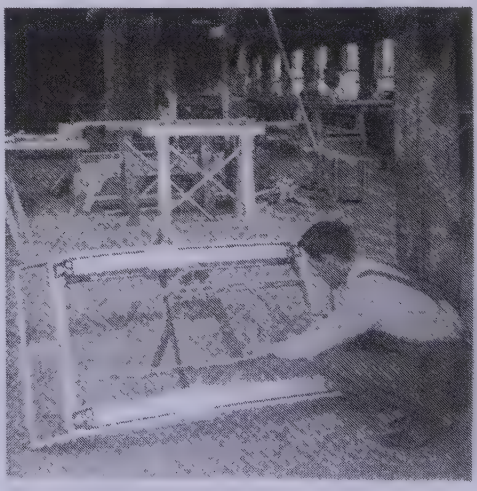
© Brown & Dawson
Stitching the Fabric on the Wings—Work For Two Men

most trying tests successfully. All of which goes to show that here in America we have the facilities for turning out rotary and stationary types of engines in whatever quantities called for by the United States air forces and those of our allies. Much interest attaches to the work of one of the Government's committees to standardize the aeronautical engine for our air fleet, in order that engines might be turned out by converted automobile factories in an expeditious, economical manner. The standardized engine, which will probably be known as the United States type, is to be made up of standardized, interchangeable parts; and the same cylinders and parts to a greater or less extent will be available for an engine of four, six, eight, twelve or sixteen cylinders, just as a sectional bookcase can be built up to any height.

In contradistinction to the manufacture of the engines, the propellers represent high-grade woodwork and do not lend themselves readily to quantity production methods. In American practice Honduras mahogany, birch and white wood are most commonly used, with ash, gum, spruce, maple and poplar as occasional alternatives. Because of its light weight, strength, ease of gluing, and comparative freedom from changes caused by climatic conditions, spruce is widely used for engines up to 50 h.p. For engines of greater horsepower the other woods are used, sometimes in combination; that is to say, alternate laminations of maple and spruce, for instance. For high-power engines quartered white oak is considered excellent material; and for extreme climatic conditions, such as service in the tropics, Honduras mahogany, which ordinarily is considered only moderately strong, hence not as desirable as other woods, is preferable because it is least affected.

The seasoning of propeller wood is an important phase in the making of propellers. Although wood should preferably be air-seasoned for a period of about five years, it is difficult to obtain wood even two years old. For this reason the wood is placed in a dry kiln and treated to a heat gradually rising to about 140°. Steam introduced into the kiln causes the pores of the wood to open up, allowing the impurities to escape. This treatment is continued for several days, sometimes as much as two weeks, after which the wood is allowed to dry.

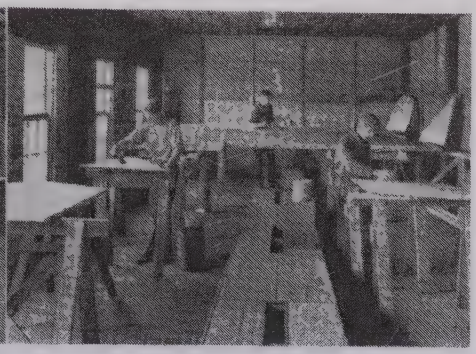
After being dressed down to the thickness of the laminations, the laminations are piled up in a staggered order and clamped firmly together to give the glue a chance to set. Obviously, the wood must be free from knots, dry rot and other flaws. From one to two



© Brown & Dawson
Truing Up a Wing Tip by Tension Inside the Wing Cover



Varnishing the Linen Wings After the Material Has Been Treated With a Cellulose Acetate Solution



© Brown & Dawson

Cutting Linen For the Wings and Leather For the Coverings For the Seats

tons pressure is applied to a block measuring 10 feet long by 12 inches wide, depending upon the hardness of the wood used.

Once the laminations are firmly glued the block is carefully carved by machine and by hand to the desired shape. Special propeller-shaping machines are available which carve a block to the shape of a finished propeller used as a model, and in this way reduce materially the amount of hand labor required. The propeller is finished off with a metal hub piece and a glossy coat of varnish only after it has been tested for accuracy of design and balance.

The body of an aeroplane, as previously stated, consists of a wooden framework representing the finest class of carpentry. The various members, cut, trimmed and sandpapered to the correct size and shape, are assembled to form the center part or body of the machine, which is known as the fuselage. More and more the aircraft constructors are coming to use metal fittings in larger quantities which result in not only a simpler assembly of the parts but a better product. Metal parts are used for joining wooden members, and stout steel wire is employed to brace the delicate structure. Wood is still the most commonly used material in aeroplane construction, although much progress has been made in the all-metal craft during the last few years. Ultimately the aeroplanes will be made of metal for the most part, and probably stamped out in large numbers; but for the present wood is still the leading material.

The wings of an aeroplane represent an interesting case of delicate woodwork, for in order to reduce their weight to a minimum the rib members are carefully sawed out; in truth, these ribs are strongly suggestive of Swiss cheese in thin slices. Transverse beams serve to support the ribs and give shape to the wing section, and all the parts are carefully glued, nailed and screwed together. The shape of the ribs is not a haphazard one; indeed, it is the result of numerous experiments, and upon its accuracy in the finished product depends the success or failure of the aeroplane as upon nothing else.

With the framework of the wings completed, the next step is to cover them with a fine grade of linen,



© Brown & Dawson

Building the Fuselages or Bodies, Wings, Struts and Floats of Light Hard Wood. The Parts Are Cut by Machinery and Assembled by Hand



The Press in Which Strips of Mahogany Are Glued Together to Make the Block Out of Which the Propeller Is Carved

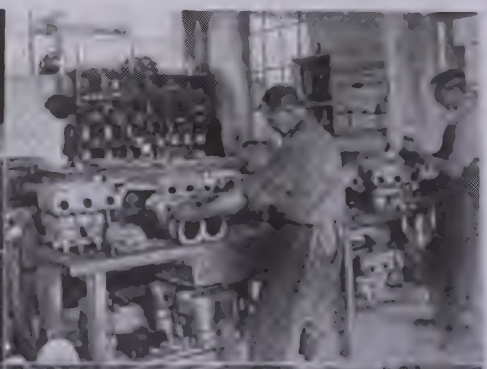


© Brown & Dawson

Fitting the Metal Work to the Propellers After They Have Been Cut and Finished

top and bottom. The linen is sewed together and nailed or glued in position, and then treated with what is known as "dope," the function of which is to shrink the fabric so that it forms a taut covering.





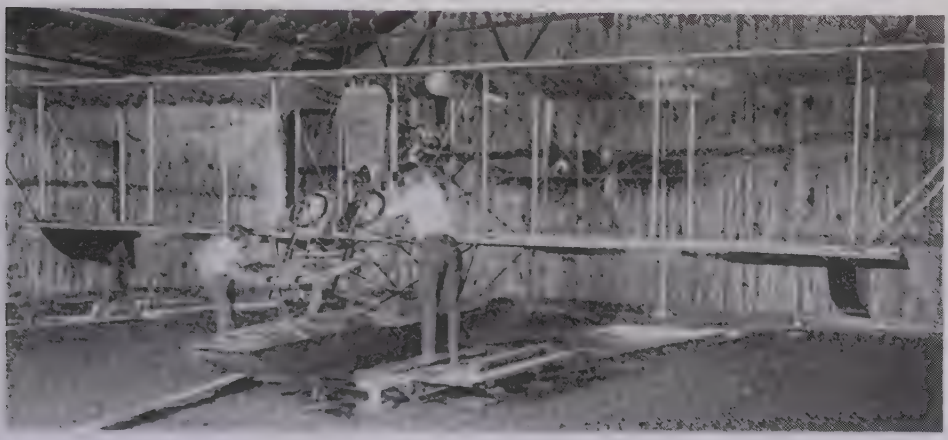




ASSEMBLING THE ENGINES

Four Views, Showing How the Engines Are Put Together and How the Fuel Tanks Are Tested

© Brown & Dawson



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A New School Machine Which Has Been Adopted by the U. S. Army For Beginners. The Pupil and Instructor Sit Side by Side. The Controls Are All Double

Spars, landing chassis, upholstery, fittings and other items still remain to be manufactured, after which the assembling of the aircraft can begin. The engine, which has been previously tested on the "block" or stand with its propeller for a certain length of time, is placed at the forward end of the fuselage, in the case of the usual tractor machine. The fittings and instruments are mounted in place, and the seat or seats are upholstered. The guy wires or stays, which are the all-important means of making rigid the otherwise fragile structure, are strung between the wings and fuselage and tightened up by means of turnbuckles. The landing chassis, already in place, is fitted with the rubber-tired wheels, and the aircraft is ready for the testing ground, where it undergoes its first trial flight.



© Brown & Dawson

A French Machine, Which Has Been Through Many Battles, Now in This Country to Serve as a Model For the Pupil to Study. This is a One-Man Machine and the Machine Gun Is on the Bow

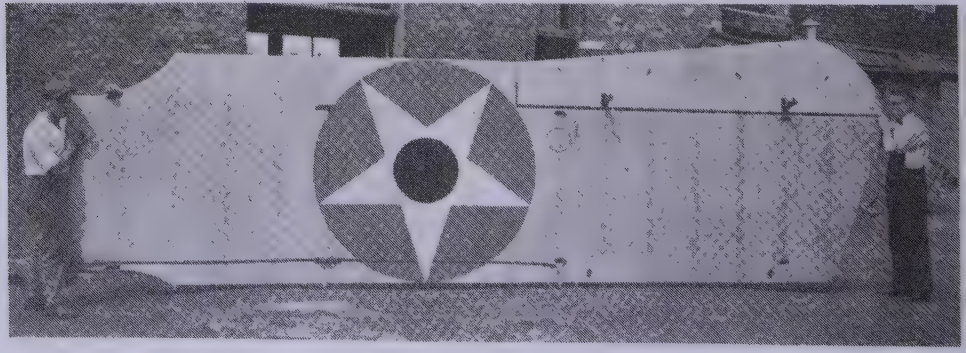


A School Machine Returned After a Flight For Slight Repairs © Brown & Dawson

All this is how the mechanical bird is hatched, from inception to completion. The work, throughout, must be of the most painstaking character, and the sign which an aircraft constructor has hanging throughout his plant is, in this connection, self-explanatory: "Notice: A concealed mistake may cause a brave man to lose his life." Absolutely true; and none but the most skilled and conscientious workmen should be employed in this work which may mean so much in carrying out our part in the world war.

The war has given a great stimulus to the building of aeroplanes. The aeroplane has played a most important part in the world's conflict, and the demand for these "birds" has greatly exceeded the supply. Several plants are now running in this country, turning out the machines as fast as possible. Starling Burgess, who at one time devoted all his attention to sailing yachts, is now sending out one complete flying machine a day from his factory at Marblehead, and with the demand that has been created by this country many more will be built. Congress recently appropriated $600,000,000 with which to build aeroplanes, and it is the plan of the aeronauts that so many machines shall be sent to Europe that the Germans will be driven from the air and not being able to watch the work of the allies they will be almost helpless.

Many flying schools have been established in different parts of the country, where men are training to handle the huge fleet of ships that are to be built. When the war is over flying will become one of the most popular of the sports in which men will indulge. It was fast growing in popularity before the war, but it has taken the war to develop the art of flying and to enable the builders to turn out machines that are comparatively safe. Flying contests will become as ordinary as power-boat races and not only will short distance events be arranged but flights across the continent and across the ocean are bound to come in the near future.



The American Emblem, a White Star in a Circle of Blue and a Red Ball in the Center of the White Star, as It Is Painted on the Wings © Brown & Dawson

New Yachts of the Season Attract Attention

Although the season is now well advanced new yachts are constantly being finished by the builders and turned over to their owners. The rush of business has caused many delays in finishing vessels that were intended for use this Summer but their owners are pleased to be able to make some cruises during the heated term. Some of these vessels have been built for pleasure while others were planned for use as patrol boats should the Government require them. Several are high speed boats and well suited for the work for which they were designed. Some of the more attractive are published herewith in The Rudder.

O. G. Jennings's New Whippet

The Whippet, built for Oliver G. Jennings, has been turned over to the Government and until the end of the war at least will be known as S. P. 89. This vessel was built by the Greenport Basin & Construction Company to take the place of the first Whippet, which Mr. Jennings used last year. The old vessel was one of the Russian patrol boats, 60 feet long, but the new patrol boat is 72 feet long, 12 feet breadth, and is powered with two Sterling engines of 300 h.p. each, which in trials have driven the vessel 24.47 knots. The contract called for 25 statute miles or just under 22 knots.

The vessel is of the concave bottom model, runs very steadily in all weathers, and handles easily.

The arrangement gives a large bridge deck space, protected by the sunken deckhouse and a windshield. The quarters below comprise the forepeak and chain locker (forward of the steel collision bulkhead), followed by the owner's stateroom, finished in white and mahogany, with a toilet room to port and large owner's locker to starboard. A small rise enters the mahogany finished deckhouse, where Pullman berths give sleeping quarters for two guests. The deckhouse is entered from behind the windshield, and the latter, with the awning over the bridge deck, affords comfortable passage to the main saloon, which follows the machinery under the bridge deck. A galley follows the saloon and the crew's quarters are aft.

The machinery space, between steel bulkheads, contains tanks in the wings for 800 gallons of gas, the two Sterling engines, a Delco generating set with special air casing for using the set as an exhaust fan for engine room, batteries, and the usual instruments for proper handling of the engines. Control is centered at the after end of deckhouse, where a special steering column, with underlight compass, chart table, portable lamp, telegraph flicker key, engine telegraph and speaking tube, gives the operator full control.

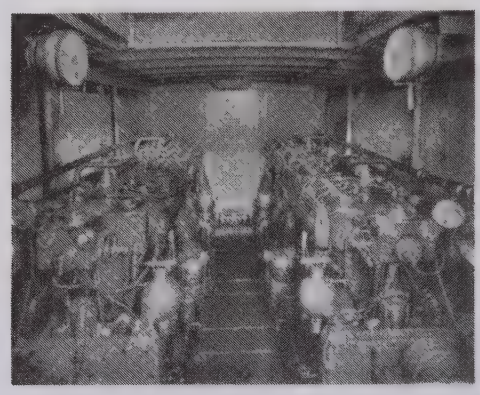
The interior treatment is rich in the extreme simple effect, and the furnishings, by Fogg, blend in with the color scheme.

On deck a 12-foot rowing tender is carried with davits and cradle, and an Andrade windlass handles the Herreshoff anchors.

The initial run of Whippet was from Greenport to New London, approximately 27 miles, then 12½ miles up the Bay, then back to New London, thence to Greenport, a total of 104 miles, made at a sustained speed of 24.47 knots. The following day a short run was made with only the testers aboard and various adjustments of fittings, etc., attended to. The finishing touches were put on Whippet.



Whippet, O G. Jennings, Owner. Built by the Greenport Basin & Construction Company, Powered With Two Sterling Engines of 300 H.P. Each; Speed 24.47 Knots



Engine Room of Whippet, Showing the Two Model F Sterling Engines of 300 H.P. Each

The third day, Whippet was taken out and raced down the Bay for two hours, the engine turning over 1,000 r.p.m., and while at high speed the pilot "about faced" and Whippet swung, shooting a transparent film of spray, high on the port side, as she rounded out the hairpin turn; continuing without reducing speed, she tore around Shelter Island, a distance of approximately 25 miles, then back up the Bay, still traveling at 24.47 knots, for a period of 3½ hours.

The last day of the trials was equally notable. She left Greenport at about 8:30, ran to New London and took Mr. Jennings aboard. From New London she ran to Bristol. After luncheon the Whippet ran to Newport. She docked at the Training School, and Mr. Jennings tendered his yacht to the U. S. Government. She was measured, inspected, two trips were made with the naval officials aboard, and she was accepted at once.

Eastern Y. C. Patrol Boats

Members of the Eastern Y. C. some time ago placed orders with the Herreshoff Manufacturing Company for eight 62-footers for use as submarine chasers. The designs of these boats were approved by the Navy Department and four have been delivered and are on patrol duty. The commander of this unit is Richard S. Russell and his flagship will be an 80-footer which is now nearing completion.

The first of the 62-footers is named Apache and is commanded by Robert F. Herrick, the Harvard rowing coach. All of these boats are named and hold their names until they have satisfied the Government inspectors that they are able to do the work to which they are assigned, and then the names give way to numbers with the letters S. P.—scout patrol—in front of the numerals.

The power of these boats consists of Model F, eight-cylinder Sterling engines of 200 h.p. The contract speed was 24½ miles per hour, and the actual speed over a measured mile course was in excess of 25 miles. This is the sustained speed and it will probably be somewhat increased as the engines see more service, making more of a success of the type than was expected even by the most optimistic.

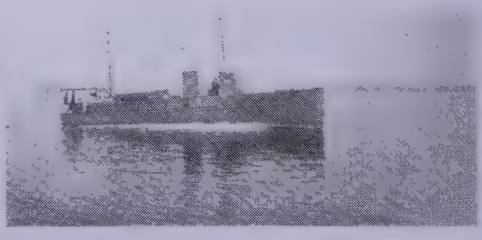
With the exception of a small rear cockpit, the entire boat is cabined. The forward deck is high and but slightly crowned. It is accessible both from the conning tower and from the runways on each side of the main cabin. A novel departure is the entrance to the engine room and forward quarters through the stack, while the design of the tower is both original and quite militaire. Boats of this design are apparently setting the style in submarine chasers and their increasing sturdiness of build is becoming more noticeable as they demonstrate their usefulness. These boats will meet incoming steamers, examine their papers, search if necessary, do patrol duty, tend nets, act as messengers, and perform the various services, necessary in war time, the omission of which might allow incendiary damage to harbors and cargo steamers.

New Dauntless for the Navy

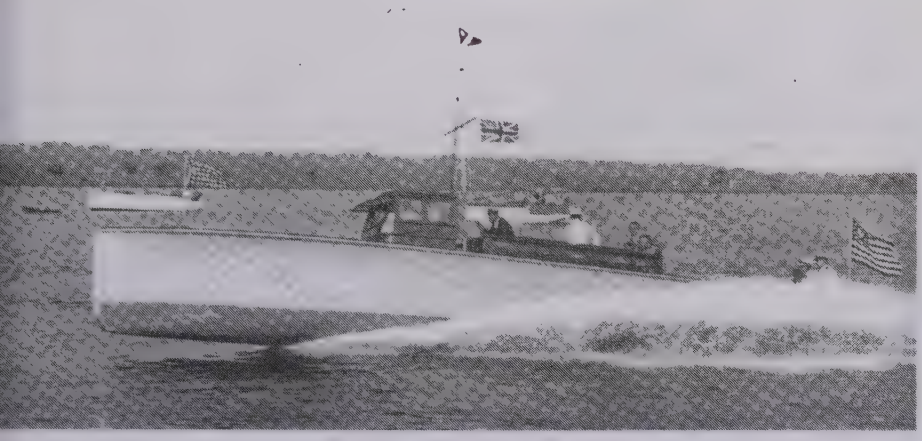
Dauntless is the name of a speedy despatch boat which has been built at the Dauntless Ship Yard at Essex, Conn., for Roy T. H. Barnes, of Hartford, Conn. The new vessel has been tried out, shown high speed, and will be offered to the Navy Department for any service it may be fitted for. Dauntless is a name honored in the U. S. Navy. A sloop-of-war was built at Essex many years ago from timbers hewn from nearby



Apache, Robert T. Herrick, Owner, Eastern Y. C. Patrol Boat, Built by Herreshoff; Powered With a Sterling Engine; Speed 25.5 M.P.H.



Snark, a Herreshoff-Built Patrol Boat Owned by the Eastern Y. C.; Equipped With a Sterling Engine; Speed 25.5 M.P.H.



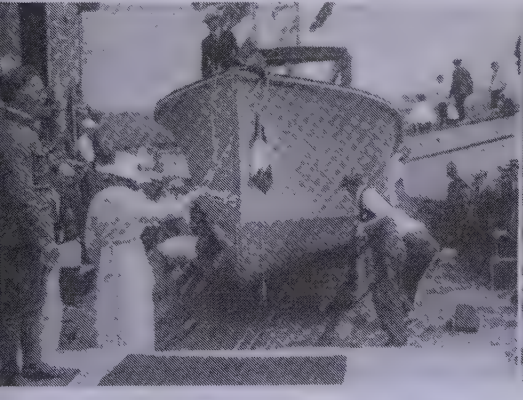
Dauntless, Despatch Boat, Roy T. H. Barnes, Owner; 45 Ft. Long, 8 Ft. 10 Inches Breadth, Designed by Ernest Way, and Built at Essex, Conn.; Equipped With an 8-Cyl. Duesenberg Engine

ests and named Dauntless. She has a history of ch the country is proud and having grown in ex and having had many of her crew from that age, naturally Essex takes a great interest in naval irs and in the new Dauntless.

The idea of building a new Dauntless originated n members of the Dauntless Y. C., of Essex, who e watched the vessel grow and who attended in body to witness the launching. Miss Barbara nes, daughter of one of the founders of the new yard, christened the yacht. Before the launching rt patriotic addresses were made by several minent men, and ten minutes after the yacht was he water she was off on a trial trip, having on rd the launching party, among whom were Gov- or Marcus H. Holcombe, former Governor Weeks, former U. S. Senator Morgan G. Bulkeley, Rear-Admiral William Cowles, E. P. Decker, of the Duesenberg Corporation, Roy T. H. Barnes and C. A. Goodwin.

Dauntless was designed by Ernest Way, of Hartford. Her dimensions are: length 45 feet, breadth 8 feet 10 inches, draught 3 feet. Native white oak has been used for the frames, the planking is white cedar and the finish mahogany. The cabin is under the forward deck and the entrance to this cabin is through the pilothouse. The engine room, 15 feet long, is next aft, and in the stern is a large self-bailing cockpit, under which are the gasolene tanks. There are sleeping accommodations for five persons.

In the engine room is a complete starting and lighting outfit and a 350-h.p. eight-cylinder Duesenberg



Miss Barbara Barnes Christening the New Despatch Boat Dauntless at Essex, Conn.



Engine Room of Dauntless, Showing 8-Cyl. Duesenberg Engine

patrol engine. The engine room is covered by a removable mahogany house with two entrances and is well lighted and ventilated.

The exhaust pipe is a copper tube, 20 feet long and 6 inches in diameter. The screw shaft is of bronze, 2 inches in diameter. The stem band is of bronze casting and the rudder is a solid bronze casting. The propeller is a Columbian Ailsa-Craig, 24 by 36 inches, and was specially made by the Columbian Foundry, of Freeport, L. I.

A trial was made on the day following the launching over the measured mile at Essex, and Dauntless made an average speed with and against the tide of 27.34 miles per hour at 1,000 r.p.m., and 35.02 at 1,305 r.p.m.

The next day she made a run of 41 miles for gasolene consumption with the following results: Distance, 41 statute miles with and against the tide in fresh and salt; time consumed, 1 hour 40 minutes; average speed, 25 miles an hour; gasolene consumed, 27 gallons, or 1½ miles per gallon; engine speed, between 900 and 930. Following this run a trial was made over the measured mile, at 1,000 revolutions. The vessel made the mile in 2 minutes 9 1/5 seconds with the tide and 2 minutes 10 seconds against the tide, an average of 27.774 statute miles per hour.

The Dauntless Ship Yard is laying the keels for two 65-footers on similar lines with approximately the same power as the Dauntless, an eight-cylinder Duesenberg engine in each.

Corlew II on the St. Lawrence

One of the most attractive cruisers seen on the St. Lawrence this season is the Corlew II, owned by L. L. Curtiss, of Memphis, Tenn. Corlew II made the trip from Bay City, Mich., where she was built at the Defoe Boat and Motor Works, through the Lakes, stopping at Buffalo, to Alexandria Bay. While at Buffalo Mr. Curtiss kept open house in true Southern style, and many yachtsmen and others who visited his new yacht admired it greatly.

Corlew II is a most attractive vessel in every way. She is 65 feet long, 14 feet breadth and 4 feet draught. No large crew is required to handle the yacht and every inch of space has been utilized in the interior arrangements without crowding. Mr. Curtiss is his own captain and his crew consists of two jet-black boys who are engineer, cook, deck hands and utility men. The forward cabin is glass enclosed, with a built-in leather-covered davenport, backed against the after cabin, suggesting a pilothouse. A bronze binnacle is ornamental as well as useful, and charts, pilot rules and regulations are easily accessible near the mahogany steering wheel, controls and reverse lever.

The yacht is driven by a 70-h.p. Sterling engine, and in the engine space a Delco heating and lighting plant is installed. In this compartment are two pipe berths for the crew. Aft of the engine room are two staterooms, divided by a stairway on one side and a bathroom on the other. The berths are double, with mahogany dressers at the foot. At the forward end are full-length clothes lockers and washbowls, Sands' folding type, and a number of glass-knobbed drawers and locker doors, paneled in mahogany. The ceiling has been arched over the berths and slightly curved over the aisles. There is 7 feet headroom in these staterooms. The carpets are a rich green, the fittings deep-toned mahogany, the ceiling white enamel and the hangings pink and green cretonne.

The main cabin, which is 12 feet square, has the same color scheme with an added note of brown and tan. The hangings are of an olive green shade, which contrasts effectively with the willow furniture. The buffet and furnishings are mahogany, and the silver on the buffet and bronze inkstand on the desk make the picture effective. The galley, which adjoins this saloon, is large, well ventilated and completely fitted.



Aboard Corlew II (Left to Right), Charles A. Criqui, H. J. Defoe, Mrs. H. J. Defoe and L. L. Curtiss, Owner of the Yacht



Corlew II, a 65-Foot Cruiser, Built For L. L. Curtiss, of Memphis, by the Defoe Boat Works. She Is Equipped With a 6-Cyl. Sterling Engine of 70 H.P., and Makes 14 M.P.H.

Mr. and Mrs. H. J. Defoe made the trip from Bay City on the Corlew II with Mr. Curtiss, and at Buffalo Charles A. Criqui joined the party. The yacht easily makes 13 miles an hour and runs as steadily as an ocean liner. Leaving Bay City she ran by Scajaquada Creek, the little inlet from which Admiral Perry's fleet sailed to battle in Put-in-Bay, to Port Colborne, where some guests were landed. The yacht then proceeded on her way up Lake Erie through the Welland Canal to Port Dalhousie and through Lake Ontario to Alexandria Bay and the Thousand Islands.

Janice Now on a Cruise

William P. Foss, of Nyack, is now cruising on Lake Champlain in his new 52-footer Janice, which was recently completed by her designers and builders, the Luders Marine Construction Company. In general design Janice is somewhat of an improvement on the day cruisers, as she has lots of room, and is quite fast.

Janice is 52 feet long, 11 feet breadth, and makes 30 miles an hour. The boat is well built, with frames 10 inches apart and planked with a double thickness of mahogany. There are three watertight bulkheads, and the forward and after cockpit are water-tight and self-bailing. The forward cockpit has an awning, glass windshields in front and side curtains, while the after cockpit is exposed and affords an opportunity for a sun bath.

The cabin is in the after house and has room for a party of eight. By using the settee in the corner as a bed and opening a concealed Pullman berth, sleeping accommodations for two are provided.

The yacht is driven by two eight-cylinder, 6 by 6-inch Van Blerck engines of 200 h.p. each. These



Cabin of Corlew II, Built by the Defoe Boat Works For L. L. Curtiss, and Now Cruising on the St. Lawrence River



© Brown & Dawson

Janice, W. P. Foss, Owner; Length 52 Ft., Breadth 11 Ft.; Designed and Built by the Luders Marine Construction Company; Equipped With Two 8-Cyl. Van Blerck Engines; Speed 28 M.P.H.

engines are electrically started and are so controlled that the speed can be cut down to 6 miles an hour. The crew's space is forward of the engine room. The gasolene capacity has been worked out on a generous basis; 380 gallons are carried in three Janney-Steinmetz tanks, 40 gallons of lubricating oil in tanks, and the fresh-water supply is large.

Juniper and Duquesne II

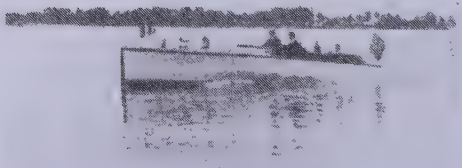
Juniper is a runabout 33 feet by 6 feet breadth, belonging to Wm. D. Sargent, of Bayonne, N. J., who summers at Alexandria Bay. She was constructed by Hutchinson Brothers, who say she made 28 miles per hour on her trial trip. The power plant is a four-cylinder, 100-h.p. Model F Sterling.

Duquesne II is a Leyare runabout, owned by Mr. Alexander R. Peacock, of New York, who also enjoys his summer at the Thousand Islands. This boat is 40 feet long by 6 feet breadth, and is equipped with a six-cylinder, Model F, 145-h.p. Sterling. She averages 30 miles per hour.

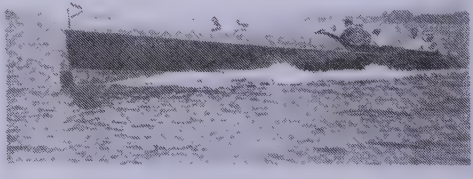
As a means to transportation and intercommunication among the islands, these boats are indispensable. It would seem that the Thousand Islands are just one thousand reasons why one should own a power boat, not only as a means of necessary transportation, but to fittingly enjoy the incomparable scenery that abounds. England has her Thames, Italy her Venice, Europe throughout is replete in Monacos and archipelagos, dependent upon history and picturesque costumes for their interest; but none can vie in scenic beauty with the Paradise of America.

For beauty, there are palaces, castles, wonderful gardens, with gray granite walls, drooping now with billows of crimson roses; white-pillared homes in a setting of green lawns and dark pines, the sunlight spattering through—and the scene colored with the purple flowers of the clematis.

For thrills there flows a rapids where the hands of the gods tear to infinitesimal particles the blue-green transparent waters of the St. Lawrence. A fast runabout, dashing through the rapids, is hurled upward like a pitching bronco, poised an instant, then abruptly shot downward to bury her nose in a swirling mass of foam. Anyone who has ever ridden through the rapids has experienced sensations akin to no other, not excepting flying and



Juniper, 33-Foot Runabout, Owned by Wm. D. Sargent; Speed 28 M.P.H.; Driven by a Sterling Engine



Duquesne III, a Leyare Runabout, Owned by Alexander R. Peacock. Makes 30 M.P.H. With a Sterling Engine of 145 H.P.

racing in all its forms, but it takes an experienced boatman, a mighty good craft, and a reliable power plant to negotiate them.

Ralph Pulitzer's Mystery II

About a year ago the Navy Department placed orders for two patrol boats, one 66 feet long and the other 45 feet long. These boats were planned with the idea of giving yachtsmen suggestions for boats they might be disposed to build which would be serviceable in time of war. The 66-footer was built by the Luders Marine Construction Company at Stamford and has since been finished and tried. The 45-footer was built by the George Lawley & Son Corporation. Ralph Pulitzer was the first to accept the Government's plans and have a boat built, but he had 5 feet added to the length, making it 71 feet long and has two additional staterooms. The breadth is 13 feet, and the draught 3 feet 9 inches.

The living quarters in this boat are divided by the machinery space, which is amidship, and in this way two distinct suites are secured. In the after deckhouse, a low cabin trunk is the main living room and forward of this is the galley. The interior finish throughout is white with African mahogany furniture.

The power plant consists of two eight-cylinder Duesenberg patrol engines of 400 h.p. each, which drive twin screws. These engines turn a Hyde propeller 23½ by 28 inches 1,580 r.p.m., giving a speed of 25 knots. The fuel tanks hold 1,800 gallons of gasolene in three heavy copper tanks and there is a reserve tank of 300 gallons in the lazarette. This fuel will give a cruising radius of more than 500 miles. The vessel is illuminated by electricity, two independent 5-k.w. Mills generating sets having been installed. With these two sets the wireless outfit, the battery of three searchlights and the bank of storage batteries can be properly supplied.

There is a bridge deck the full width of the vessel and 9 feet long between the two deckhouses. A special steering station is over the after end of the engine trunk; this affords a weatherproof covering over the entrance to the engine room, permitting it to be kept open in stormy weather. Large port lights and a hinged front to the conning tower also give good ventilation and opportunities for observation. There is a shelter seat across the front of the after house which is protected by an awning and an extension roof from the fixed roof of the conning tower.

Launch of the Sanwan

Robert Moran, founder of Moran Brothers Company, which is now known as the Seattle Construction and Dry Dock Company and a part of the Tod Shipyards Corporation, has had a yacht built for his own use. In order to enjoy the pleasure of seeing his yacht grow, he had it built on his own estate at Rosario, on Orcas Island, near Seattle. The yacht, which is named Sanwan, was launched and several hundred friends of Mr. Moran were invited to the launching.

Some years ago the battleship Nebraska was built at the Moran yard and now in the same yard several Government vessels are in process of construction. Mr. Moran invited friends to attend the launching from all parts and chartered a steamer to take about four hundred from Seattle to his home.

The Sanwan is an auxiliary schooner 132 feet overall length and 25 feet breadth. She is equipped with two six-cylinder Corliss engines, but she is bored for one center line propeller, as Mr. Moran, later on, intends



© Brown & Dawson

Mystery III, Ralph Pulitzer, Owner; 71 Ft. Long, 13 Ft. Breadth; Built by the Luders Marine Construction Company, and Equipped With Two Duesenberg Engines of 400 H.P. Each; Speed 25 Knots



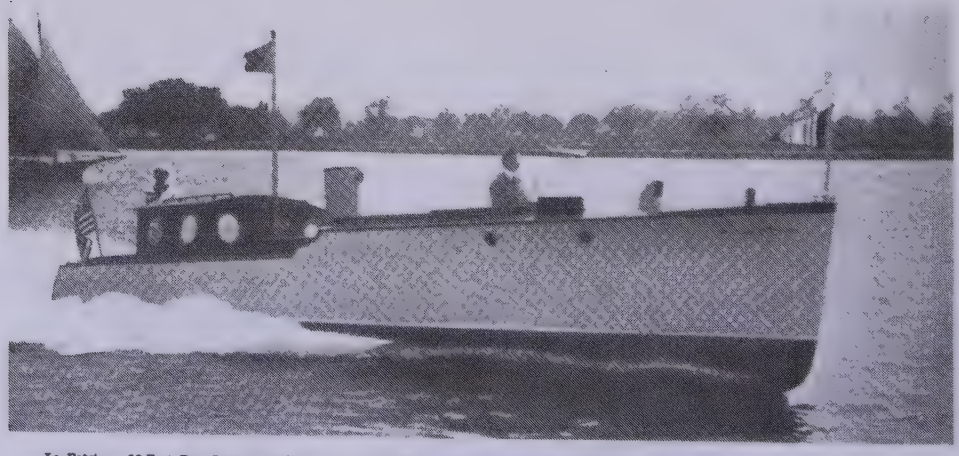
Sanwan, Auxiliary Schooner, Built by Robert Moran on His Estate at Rosario, Near Seattle. To Be Used For Patrol Work

to install a heavy-oil engine. She has three polemasts, will be fast under sail and is expected to make 10 miles an hour under power. Mr. Moran has offered the yacht to the Government and she has been accepted. She will be used for patrol work.

Stuart Wyeth's 36-Foot Day Cruiser

Stuart Wyeth, of Philadelphia, has recently had a 36-foot day cruiser built by the Luders Construction Company at Stamford, which he is using to run between his summer home on Long Island Sound and New York City. This new yacht Mr. Wyeth has named La Patrie. Speed was the chief requisite and with an eight-cylinder 5½ by 6-inch Van Blerck engine of 175 h.p. this boat makes 31.5 miles an hour. This engine is placed amidships under a low house. Aft of this is a shelter entered from the cockpit aft. This is a comfortable apartment for use in wet or stormy weather. The helmsman's cockpit is forward and the helmsman is well protected by a folding hood. The boat is unique in many respects and ideal for the purposes for which she was built and for afternoon running on the Sound.

Mr. Wyeth has owned many yachts, some large and some small. He has raced too at times and has always had a vessel that has attracted attention because of originality. La Patrie is no exception to this rule and she runs between Stamford and New York with the regularity of a ferry but of the high-speed type, and with her speed she can land Mr. Wyeth in the city quicker than if he traveled by train.



La Patrie, a 36-Foot Day Cruiser, Built For Stuart Wyeth by the Luders Marine Construction Company; Equipped With a Van Blerck Engine; Speed 31.5 M.P.H.

Speeding the Parting Pest

By W. R. Gilbert

COLLIER was a good enough chap in his way, but there was no doubt about it, he was getting a bit of a nuisance. Charlie and I went down to Mudsea at week-ends to sail our five-tonner Cascade, but Collier seemed to be under the impression that the whole object of our visits was to entertain him. Every Saturday evening, he came on board with unfailing regularity and invariably stayed yarning and smoking in our cabin long after the hour at which decent folk make a practice of turning in.

It must not be supposed that he was anything in the nature of a bore. Far from it. He had knocked about all over the world, sometimes as a saloon passenger on a liner, but more often in the fo'castle of a "limejuicer." He had, moreover, tried his luck at cattle ranching and gold mining, and the narration of his adventures in many lands was both amusing and interesting, although I am bound to confess they often impressed us as being a trifle highly colored.

We had struck up an acquaintance with Walter Collier quite by chance and knew little about him save that he was the only son of a wealthy man, who was heartily sick of his eccentricities. And there can be but little doubt that Walter's past life had been punctuated with lurid interludes. To keep him out of mischief his father had bought him a partnership in a small yachtbuilder's business at Mudsea—from which the profits appeared to be absolutely nil—and made him an allowance, which Walter frankly told us was totally inadequate.

During the week he had no one to converse with except the local boatmen, and growing heartily sick of his own company, never failed to visit the Cascade whenever we were aboard. We should not have minded so much had he not kept such infernally late hours. But being up until the small hours of the morning, made us loath to turn out early, with the result that we frequently missed the tide, and ruined our week-end trip. And so we resolved by hook or by crook, to get rid of him at a decent hour the very next time he visited us.

The Saturday after we had come to this resolution, we went down to join the Cascade for a month's holiday cruise. It was our intention to turn in early, with a view to getting underway at daybreak. But shortly after dinner a shore boat bumped alongside and having left some one on our deck, pulled away. A few moments later the burly form of old Collier appeared in the cabin doorway. Tugging from his pocket a bottle wrapped in pink paper, he banged it down on the table with the remark:

"There's my whiskey and I'm not going till four o'clock in the morning."

Charlie and I looked at one another, but refrained from comment. We, however, busied ourselves in stowing away stores in their allotted places, in the hope our unwelcome visitor would take the hint that he was not wanted, and go. But not a bit of it. Removing a disreputable old monkey jacket and red muffler, Collier called loudly for the corkscrew, and drawing the cork of his bottle of whiskey proceeded to enjoy himself in his usual way. Had we been wise we should have told him bluntly that we wanted to turn in; but it was pouring with rain, and neither of us relishing the idea of turning out to row him ashore, we feebly gave in, and sat hour after hour listening to his yarns.

There is a limit to every one's powers of endurance, and we reached that limit somewhere about midnight. Puzzling my brains for some pretext for getting rid of our "pest," I hit on a brilliant idea.

"Let's go and rout out old Saunders," I suggested, winking covertly at Charlie.

"Yes, come along; it'll be awful sport!" shouted Collier, who had consumed the best part of the whiskey.

Saunders, I must explain, was an eminently respectable yachtsman of middle age, who practiced the simple life, going to bed at nine and rising at six with the regularity of clockwork. His yacht, the Kestrel, was lying at the outskirts of the anchorage and he was pretty certain to be in his bunk asleep.

Collier struggled into his old jacket, which would have been an acquisition to any scarecrow, while Charlie and I donned our oilskins. Then we got into the dinghy and pulled off on our expedition. As we approached the Kestrel, we could see that her cabin was in darkness, as we anticipated, but her riding light flickered at the forestay.

"We'll creep quietly on board and wake him up with a yell," I suggested, as we paddled alongside.

"You get on board first," I whispered to Collier. "Don't make a noise."

He climbed carefully on board, shaking with suppressed laughter the while. Then, shoving off vigorously, we rowed away and left him. As we pulled back to the Cascade, we chuckled at the thought of Saunders having to dress and row the best part of a mile in the rain to land Collier.

"I suppose he has a dinghy," remarked Charlie, "but I don't remember seeing one."

Neither had I, for that matter, but surmised he had hauled it out to the bowsprit end to keep it clear of the yacht, the wind being against the tide.

After a few hours' sleep we got underway at 5 a. m. bound to the Southward for a month's cruise. There was a strong Southwest breeze and indications of the near approach of bad weather, but we decided to go out and see what it was like. With a pair of reefs in the mainsail the Cascade lay down to her work, and with the water creaming under her bow made capital progress, beating along the coast with a long leg on the starboard tack. But gradually the weather became worse, and about three hours after starting we found it necessary to pull down the last reef in the mainsail and shift jibs. Even under this reduced canvas, the little yacht buried her covering board deep beneath the seething water, and labored heavily in the high sea. After a brief consultation, we decided that it was not good enough, and starting the sheets bore up for Saltmarsh Creek, which lay under our lee. It was perhaps well that we did so, for soon after we had taken up a berth in the creek it began to blow in earnest. A heavy gale kept us weatherbound

for the best part of a week, but then gave place to a soft Southerly breeze and bright sunshine.

After our long stay in Saltmarsh Creek, we were heartily tired of lying at anchor, and on resuming our cruise, we determined to keep the sea as long as possible. Lack of wind made our progress very slow, but it was very pleasant cruising gently along the coast, bathing and fishing as we went.

After about a week of this, we discovered one evening that our stores were nearly exhausted, and it was imperative that we should put into some port without delay. Fortunately Westhampton was but fifteen miles distant, and so we decided to sail there next morning. During the night a fresh breeze sprang up, and the Cascade, being anchored in an exposed berth, began to roll about. By four o'clock in the morning our berth had become untenable, and so we decided to clear out forthwith.

Three hours later we sailed into Westhampton and moored to a buoy in the outer harbor, having no intention of making a long stay. As we were stowing the sails, a coastguard came alongside and inquired: "Is that the Cascade from Mudsea?"

"Yes," I replied: "but why do you ask, we haven't been foreign?"

"I have a telegram for you, sir; been here a week or more, and they have been advertising for you in the papers."

"Good Lord!" I replied, "I wonder what's up."

Taking the envelope, I tore it open, and read the following telegram:

"John Lawrence and Charlie Carthew are earnestly requested to communicate at once with Wade & Simmonds, Solicitors, Harstow; Collier committed for trial for alleged theft of yacht Kestrel. Trial fixed for 10th August."

"I don't understand it," I said, handing the wire to Charlie; "but it must be something to do with our practical joke. We must go at once."

"Why, what's the date?" shouted Charlie.

"Today's the 10th August," said the coastguard.

Here was a pretty kettle of fish. We were 100 miles from Harstow by land, and Collier was to be tried that morning. To go by train was out of the question, as it entailed a journey that would make the distance at least another eighty miles. Then I remembered that a chauffeur I knew, Johnson, had recently opened a garage at Westhampton.

"I know he will let us have a car if he has one," I explained to Charlie. "Come along, don't stop to change."

Leaving the boat in charge of the coastguard, we jumped into the dinghy and pulled for the shore, and in a quarter of an hour were interviewing Johnson.

"I'm afraid I haven't a car, Mr. John," he said, "but I have a fine motorcycle that will get you there quicker than any car. Come in and the wife will give you some breakfast, while I get the machine ready."

In half an hour we were ready for the road. Johnson, good man, had filled the tanks and written down our route on a strip of card. The machine was one of the new 7-9 h.p. twins intended for side car work. She was a fearsome looking beast for solo work, but seemed tractable enough when I started off with Charlie perched on the carrier. Once clear of the town, I opened her up, and the big twin fairly flew. The needle of the speedometer soon rose above fifty, and with a good road we were able to keep her going at that speed for long stretches at a time, throttling her down only when we passed through towns. It was 110 miles to Harstow by road and we covered the distance in three hours and a half. The clock was striking twelve when we reached the Town Hall, where the trial was to be held. Were we in time?

After some little difficulty we found ourselves in court. There was Collier standing in the dock looking very sorry for himself, while the counsel for the defense was explaining to the jury that, despite all efforts to trace them, their most important witnesses, who were away on a yachting cruise, could not be found.

Then Collier looked up and saw us. Seizing a scrap of paper he scribbled a note and gave it to a policeman to give to his counsel, who at once exclaimed, turning to the Judge:

"My lord, our witnesses have appeared at the eleventh hour, and with your permission I will call John Lawrence."

In a few minutes I was in the witness box, telling the story of our practical joke, and when I had finished the counsel for the prosecution rose to cross-examine. But I had spoken to facts that were still very fresh in my memory, and he was unable to shake my evidence. Then Charlie corroborated my story and the end soon came. The jury returned a verdict of "Not Guilty" without leaving the box and Collier was discharged; but not before the Judge had read us a lecture upon the evils of practical joking which neither of us has ever forgotten.

Then from Collier it appeared that there was nobody on board the Kestrel when we marooned him. Having no means of getting ashore he burst open the cabin doors to obtain shelter from the rain. Having got inside he turned in to pass the night comfortably. He slept soundly until awakened by the violent motion of the yacht, and was surprised to find from the cabin clock that it was ten o'clock. Going on deck he was still more surprised to find himself at sea—but he soon found that the yacht had broken her anchor chain and drifted to sea.

It was blowing the best part of a gale of wind and Collier at once saw he would never win back to the anchorage, so he set the foresail and ran for Harstow, which he reached safely but was promptly arrested for stealing the yacht, the police having received instructions from Mudsea. The Kestrel, it seemed, had been sold some weeks previously by Saunders and the new owner was a stranger. Collier's father was away in Australia and he did not know where to turn for assistance, but a local firm of solicitors took up his case, and it was one of their telegrams which reached us at Westhampton. Collier is now a regular hand on the Cascade.



Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART IX

FIFTH Preliminary Calculation. Freeboard Necessary.—The freeboard of small power boats should be such that edge of deck does not become immersed at less than a 25° inclination. In cabin cruisers and larger boats the angle should be greater. I give on Table No. 8 a list of angles suitable for various types and sizes of power boats that are to be used in protected waters. Freeboard at bow and stern must be increased a sufficient height to make boat dry and easy in a sea but you must bear in mind that height of freeboard alone will not make a boat dry and safe. The height must be there but, in addition, the *shape* and *proportion* must be correct and in keeping with the underwater body.

When a boat rises in a seaway the stern is depressed and line of flotation and position of C.B. point changes longitudinally. With each up movement of bow the C.B. point moves aft and with each down movement it moves forward of its original position, and thus the fore-and-aft movement is like the swing of a pendulum, and upon the regularity of swing fore-and-aft of the original C.B. position depends the steadiness of boat longitudinally. It is most desirable that the fore-and-aft movement be regular, equal and limited in extent.

The motion of a boat up and down should be *less* than that of the lifting wave, and if the abovewater portion of the boat is properly proportioned and its bulk properly distributed vertically and longitudinally this desirable condition can be obtained.

The bulk above water should be proportioned to bulk immersed, and ends should be shaped in such a manner that the moment of lifting force due to action of a wave on bow will be counteracted by the moment of resistance to depression of stern due to the stern resisting immersion in water.

A boat that pitches violently over every wave is not making headway since a large part of the propelling force is exerted in driving her up and down instead of in a direct line ahead.

TABLE No. 8

POWER BOAT FREEBOARD

Approximate Lengths Feet	Runabout Breadth Ft.	Runabout Angle	Open Breadth Ft.	Open Angle	Cabin Breadth Ft.	Cabin Angle
20—24	4	35°	5	28°	7	32°
25—29	4.6	35°	7	27°	8	30°
30—34	5	34°	8	27°	9	30°
35—39	6	33°	9	27°	10	30°
40—49	7	32°	10	27°	12	30°
50—59	8	30°	11	26°	14	30°
60—69	.	...	12	25°	15	29°
70—79	.	...	..	...	16	28°
80—89	.	...	..	...	18	26°
90—99	.	...	..	...	20	25°

To Determine Freeboard Necessary.—Draw a horizontal line to represent the L.W.L. of boat at midship section, and another line at right angles to it to represent the center line of boat at midship section. Next from the point of intersection of these two lines draw a diagonal line upwards at the inclination selected for boat at midship section.

The point where this diagonal line cuts a vertical line drawn upwards from the horizontal line at a distance equal to one-half the extreme width of boat will be the top of sheer at midship section, and if the distance this point is above the L.W.L. horizontal line is measured along a vertical line the height of freeboard at midship section will be ascertained.

Fig. 40 illustrates the method of laying out these lines for a boat having 7 feet extreme breadth of beam.

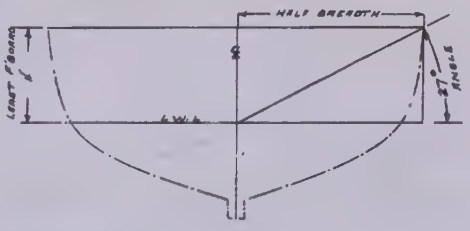


Fig. 40

The height of freeboard at bow and stern must next be selected. Experience and data obtained from boats built are the most satisfactory guides. On Table No. 9 I give freeboard measures that can be used as guides for increase of height of freeboard at bow and stern over that selected for midship section. These measures are for boats of ordinary form having concave sheer line. The measures cannot be used for straight or convex sheer-lined boats.

TABLE No. 9

Approximate Length Feet	Open Boats Increase At Bow Feet	Open Boats Increase At Stern Inches	Cabin Boats Increase At Bow Feet	Cabin Boats Increase At Stern Inches
20—24	1. 0—1.2	2—3	1.2—1.5	3— 4
25—29	1. 2—1.5	3—4	1.4—1.6	3— 4
30—39	1. 3—1.6	3—4	1.6—1.9	3— 4
35—39	1. 6—1.9	4—5	1.9—2.0	4— 5
40—49	1. 8—2.0	4—6	2.0—2.3	4— 6
50—59	1.10—2.3	4—6	2.3—2.6	4— 6
60—69	.....	....	2.6—2.9	6— 8
70—79	.....	....	2.9—3.0	6— 8
80—89	.....	....	3.0—3.3	6— 9
90—99	.....	....	3.0—3.6	6—10

6th Preliminary Calculation. H.P. Necessary for Speed.—One method of making this calculation was explained on pages 37, 38 and 39 of January issue of THE RUDDER. When I prepare the design I will explain another method and make the detailed calculations by using both methods.

A Few Brief Remarks About the Drawings.—The

impossibility of making drawings *full* size necessitates some ready and accurate method for reducing the sizes of lines and parts evenly and in exact proportion to each other.

It is absolutely necessary that the reduced size drawing be made in such a manner that accurate measurements can be taken from it. The means adopted for making the reduction is to use a scale upon which each mark represents a certain proportion of the full-sized measurement.

Thus, if it is desired to make a drawing one-quarter the size of the full-sized piece the full-sized piece would have to be measured with a full-sized rule, or scale, and then the draftsman would transfer the measurements to the paper by using a scale on which the divisions would be spaced one-quarter of the full size measurement apart. Such a scale would be termed a 3 inches to a foot scale, because on each 3 inches of it there is shown the same number of divisions, or marks, that appear on a 1-foot scale and all the divisions are one-quarter of the distance they are on a full-sized scale.

The following is a list of the scales commonly used in U. S. A. by machine and marine draftsmen.

3 inches = 1 foot. One foot appears on each 3 inches of the scale.
1½ inches = 1 foot. One foot appears on each 1½ inches of scale.
1 inch = 1 foot.
¾ inch = 1 foot.
½ inch = 1 foot.
⅜ inch = 1 foot.
¼ inch = 1 foot.
⅛ inch = 1 foot.

On all scales used in marine drafting the divisions are marked to permit inches and parts of an inch to be read as well as feet.

Usually the first division is closely divided to permit measuring inches and parts of an inch, the other divisions being divided to permit measuring feet.

Selecting the Scale to Use.—Before preparing a set of plans the designer must select the scale he will use and decide upon the size of sheet he will make the drawings on. Both of these things depend very largely upon the size of the boat, or vessel, because the size of a sheet of drawing must be convenient for handling. The larger the boat the smaller the scale. It is not necessary to make all drawings to the same scale, but it is desirable to make all drawings in a set the same, or approximately the same size. The scales most frequently used by naval architects are:

For lines and general construction plans:

¼ inch to a foot...⅜ inch to a foot... ½ inch to a foot.
¾ inch to a foot... 1 inch to a foot...1½ inch to a foot.

For details that must be shown larger than possible on general plans:

2 inches to a foot..3 inches to a foot..6 inches to a foot.

We have found it advantageous to standardize scales, and below I give list of scales used in our offices:

For boats 25 feet and under in length, we use a 1½-inch scale.
For boats between 26 and 35 feet, we use a 1-inch scale.
For boats between 36 and 45 feet, we use a ¾-inch scale.
For boats between 46 and 70 feet, we use a ½-inch scale.
For boats between 71 and 95 feet, we use a ⅜-inch scale.
For boats over 100 feet, we use a ¼-inch or a ⅛-inch scale.

The most important things to remember are: To make the size of sheet convenient for handling, and at the same time have the scale sufficiently large to enable details to be shown correctly.

On drawings of boats and vessels measurements are marked in feet, inches and parts of an inch, in accordance with the system explained below. You will note that two distinct methods are used: One for measurements marked on a lines drawing, and the other for construction and detail drawing measurements.

Explaining the System Used for Measuring a Lines Drawing

All dimensions of a boat's, or vessel's lines are expressed in feet, in inches and in eighths of an inch. Thus:

1–0–0 Means One foot—no inches—no eighths.
1–1–0 Means One foot—one inch—no eighths.
1–1–1 Means One foot—one inch—one eighth.
1–1–1 ½ Means One foot—one inch—one and a half eighth (3/16th).
0–1–0 ¼ Means No foot—one inch—and one-quarter eighth (1/32d).

From these examples you can readily understand the system. Prime marks and lettering to indicate feet and inches are omitted, therefore, the figure –0– *must* be entered whenever a dimension is omitted from a column, and all figures must be entered in the manner shown, the dash between the figures indicating the division between feet, inches, and eighths. Also note that in place of entering measures smaller than one-eighth of an inch, as 1/16th and so on, they are entered as *fractional* parts of an eighth. Thus 3/16th inch is expressed as 1½ eighths. The method is extremely easy to learn and is one that enables a workman to use an ordinary 2-foot rule, that has the regulation 1/16th divisions, when he is laying down the lines of a boat full size.

After a lines drawing is completed, the designer measures the various lines and centers the figures, in the manner explained above, on a table called a table of offsets.

It is from this table that the builder obtains measurements when enlarging the lines to full size.

On drawings that show construction details of boats and vessels the necessary measurements are marked in feet, inches and parts of an inch, the measurements given being the actual dimensions of materials used as well as the measures of details shown on drawings. I say "necessary measurements," because in many cases measurements can be omitted because the boatbuilder can obtain them from the full-sized plan that he lays down from the lines drawing and tables of offsets.

Thus on the keel construction drawings it is not necessary to give the length measurements. Thickness and depth of material are all that is necessary.

This also applies to such pieces as ribs, clamps, deck beams, floor timbers, keelsons, etc.

On the other hand, measurements of cabin details, cockpit, deck, etc., should always be given as accurately as possible; length, height, width, as well as dimensions of materials used, being given.

All measurements of such details as spacing of ribs, distance from one end of a cabin to another, are always given from center to center. Thus rib spacing is given from center to center of ribs, cabin length from center to center of bulkheads. It is important to remember this. In a later lesson I will explain this more fully.

(*To be Continued*)

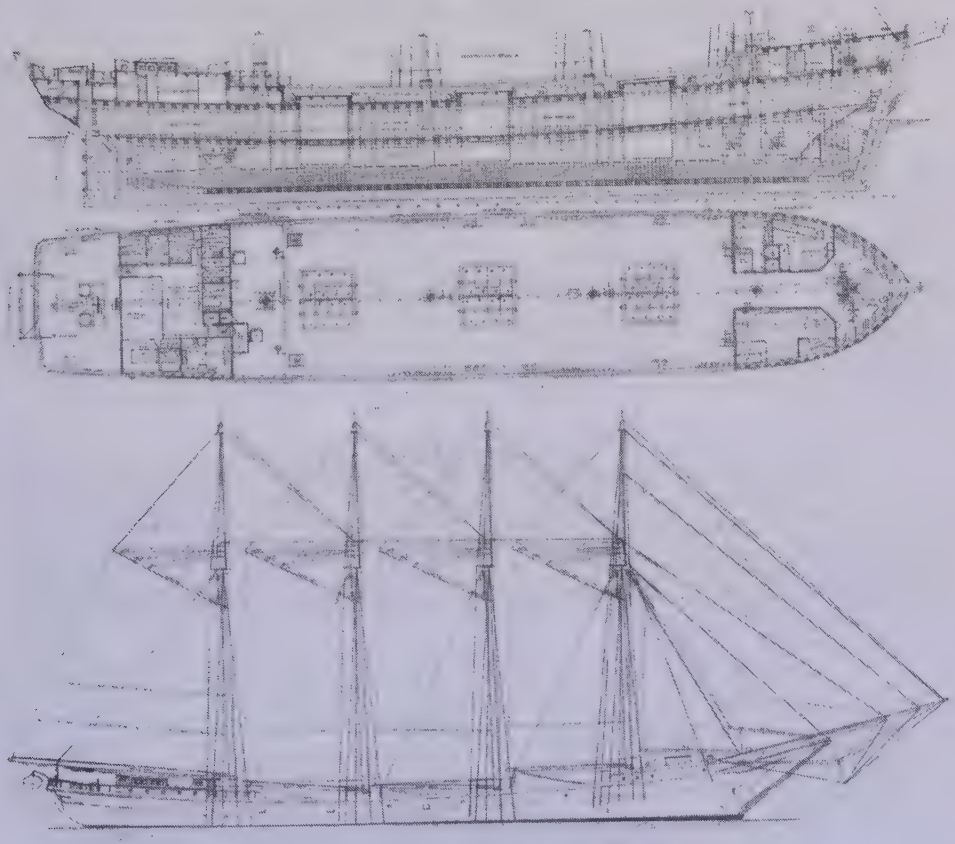
Designs

223-Foot Auxiliary Schooner

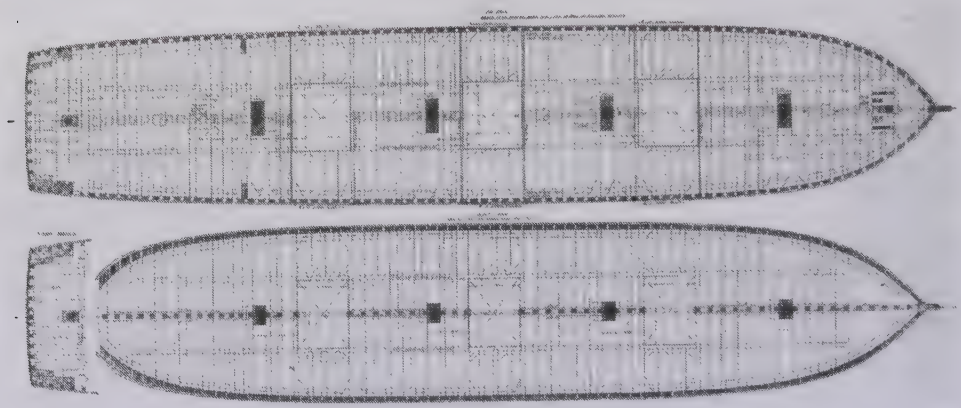
Of all the types of commercial vessels, there is probably none more interesting to the American public today than the schooner. For many years American ships on the high seas were conspicuous by their absence, but before long we will have come into our own again, for our designers have been busy and the shipyards working to the limit of their capacity.

The plans of the four-masted schooner shown herewith, through the courtesy of the designers, Cox & Stevens, are of particular interest, for altogether eight vessels, with slight interior changes, have been built from them, six in the South and two in Canada. While auxiliary power has not been put in all of them, the installation has been provided for, so that later it may be done at but slight additional cost above that of the engine. It is estimated that oil engines developing 500 b.h.p. will give a speed, loaded, of about 7 knots. For this power fuel-oil tanks to the capacity of about 200 tons would be carried amidships and in the after peak.

As a whole, the vessel is a fair representative of the type which has done excellent service along our coasts for many years, but certain new features, found desirable through experience, have been incorporated. These vessels have two full decks, poop and forecastle, and those built in the South are almost entirely of



Sail, Construction and Deck Plans of 223-Foot Auxiliary Schooner, Built From Designs by Cox & Stevens



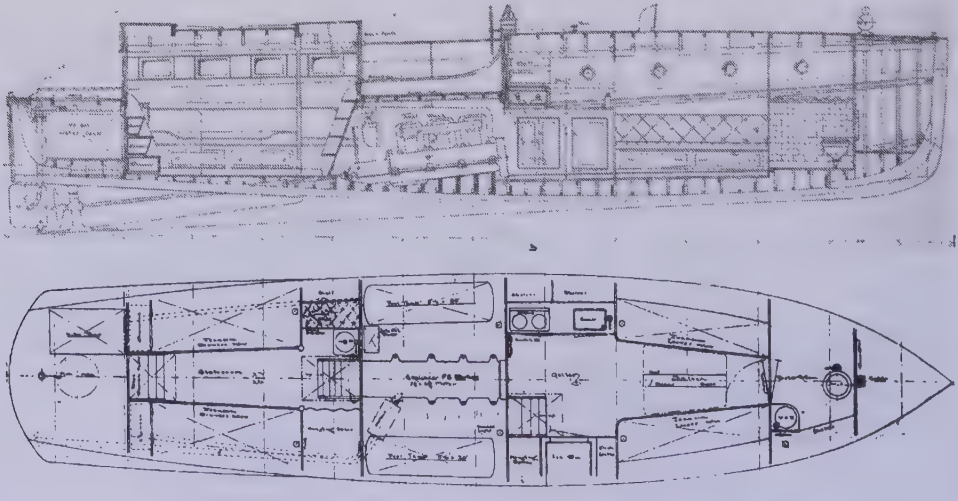
Plans Showing Deck Beams of 223-Foot Auxiliary Schooner

long-leaf yellow pine. Those built in Canada are of native wood, yellow birch, rock elm and black spruce. That they are most substantially built may be seen in the accompanying pictures, which give one a very good idea of the amount of wood entering into the construction of a vessel of this type.

The arrangements show, under the raised forecastle head, on the port side, quarters for six seamen and the galley. On the opposite side is the boiler room. A vertical donkey boiler, 60 by 90 inches, furnishes power for handling anchors, sails and cargo and for operating the feed, circulating, fire and bilge pumps, also located in this compartment. A Hyde anchor windlass is driven by messenger chain from a 7 by 10-inch double drum hoister in the boiler room. A single drum hoister of the same type is located abaft the mainmast. Twenty-six hundred gallons of water for the boiler feed is carried in the hold, forward, while tanks of 1,400 gallons capacity, aft of the spankermast, contain water for culinary purposes.

The after cabin is extended to the sides of the vessel in order to obtain the maximum space for a minimum fore-and-aft length. Staterooms are provided for all officers, including engineers, and there are also a messroom, saloon, pantry, refrigerating and store-room and baths.

The sails, blocks, rigging, anchors and cables, are the best obtainable and in accordance with the require-



Arrangement and Construction Plans of 40-Foot Cruiser Teal, Designed by J. Murray Watts

ments of the classification societies. The plans have received the highest rating for their class by Lloyd's and the American Bureau of Shipping.

The principal dimensions are as follows:

Length o. a.	223	feet	0 inches
Length on w. l.	205	"	6 "
Length on keel	197	"	6 "
Breadth, extreme	41	"	8 "
Depth of hold	19	"	10 "
Draught, loaded	20	"	9 "
Cubical capacity of hold	102,600	cu. ft.	
Gross D. W. capacity	2,100	tons	

40-Foot V-Bottom Cruiser Teal

Albert Aschaffenburg, of New Orleans, is having built at the yard of Wm. Fetterly & Son a 40-foot V-bottom bridge deck express cruiser, designs for which have been drawn by J. Murray Watts and are published herewith. The yacht is to be named Teal. The outboard plan shows a good, sturdy type of cruiser, with a raised deck forward, a bridge and steering position amidships, and a large well-ventilated cabin aft, followed by a small after deck under which is a water tank capable of holding 100 gallons. This tank is reached by a hatch in the after deck.

There is very good accommodation in this boat. In the eyes of the boat is located the chain locker, followed by a toilet room equipped with the usual plumbing conveniences, and shelves for linen. A door opens from this toilet room into the main saloon, on each side of which is a transom with lockers underneath, and a table which, folding down, allows easy passageway. Aft of the main saloon is the galley, with a companionway leading to the bridge deck. The galley is equipped with the regulation sink, stove, shelves, icebox, and hanging space. On the after bulkhead of the galley is the switchboard for the electric lights.

Directly under the bridge deck is the six-cylinder 5½ by 6¾-inch Sterling engine, with direct connections to the steering controls and wheel on the bridge deck. From this bridge deck a companionway also leads down to the after cabin, which, together with the forward companionway, makes the bridge deck instantly accessible from below, both forward and aft. This after companionway leads down into a stateroom with transom and drawers on each side, a hanging space with hooks on the forward starboard end of the transom, and a small toilet room on the forward port end. A companionway leads from this room out on to the after deck, and under each one of the steps of this companionway is a drawer.

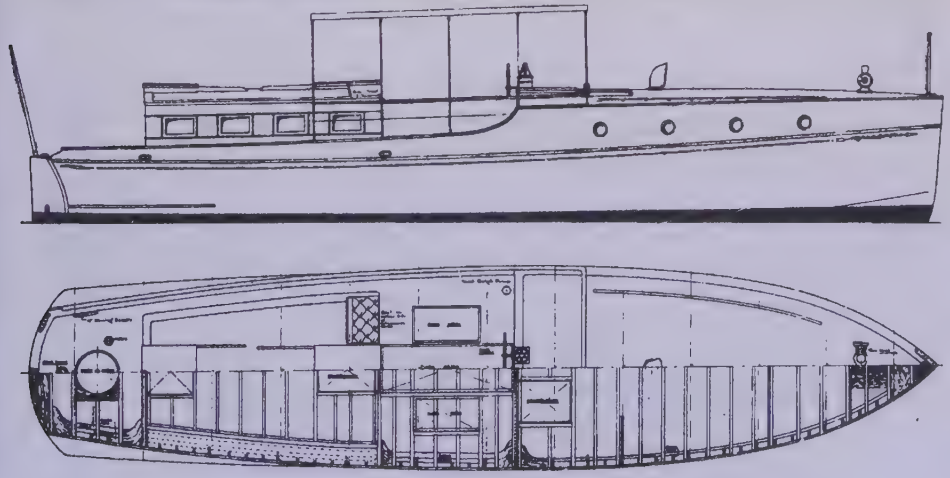
This boat will be put in commission as soon as completed this Summer and, as she will be used around New Orleans, care has been taken to make her thoroughly well ventilated and light and airy. There are eight large portlights in the forward quarters, besides a cowl ventilator over the main saloon, and a forward companionway, allowing plenty of air and light to these quarters. In the after house are eight large windows, and with the two companionways, allows these quarters to have a constant supply of light and air. A good-sized canvas awning faced with dark green protects the helmsman's position on the bridge deck.

The general dimensions are:

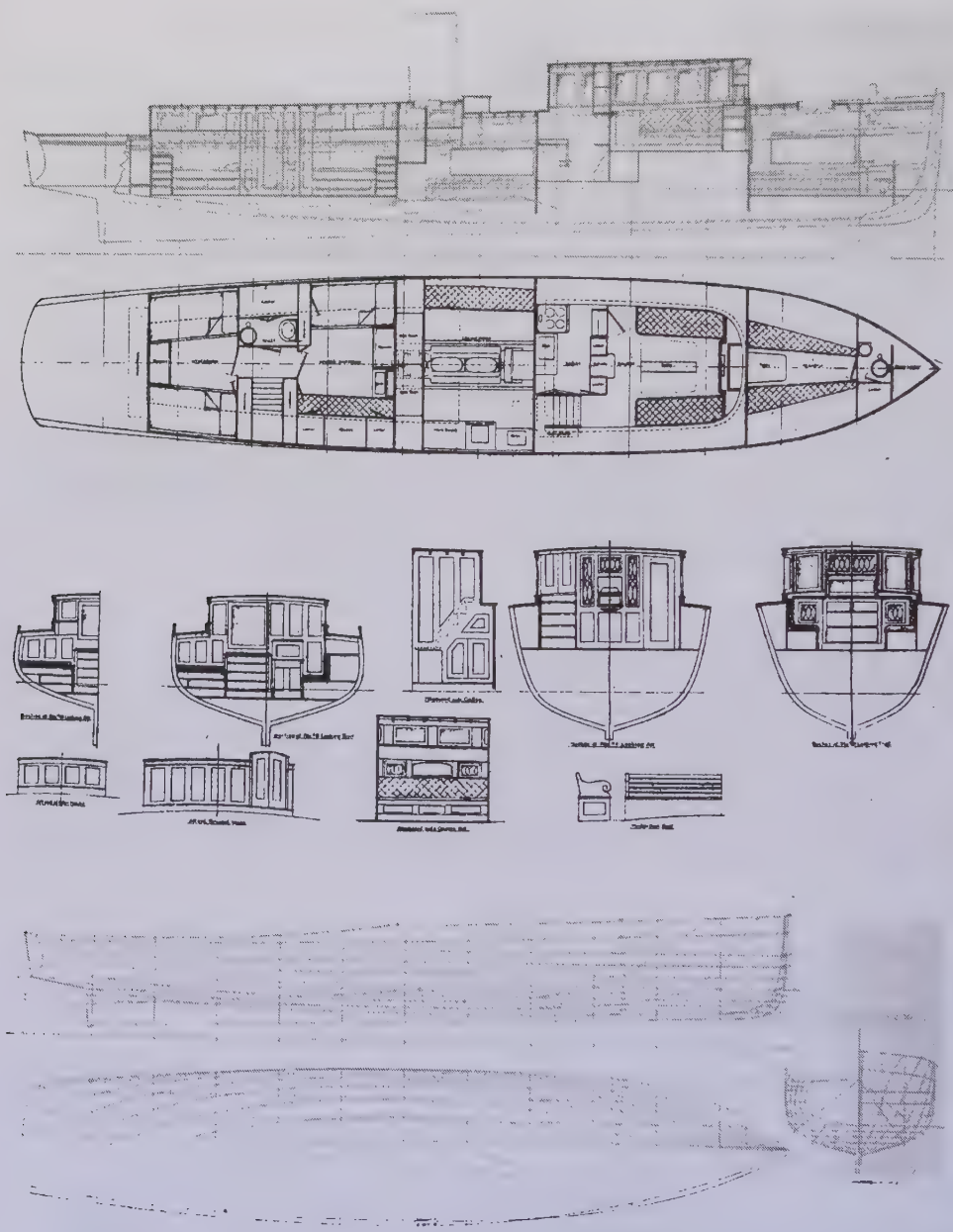
Length o. a.	40	feet
Length l. w. l.	39	"
Breadth	9	"
Draught	3	"

67-Foot Power Cruiser

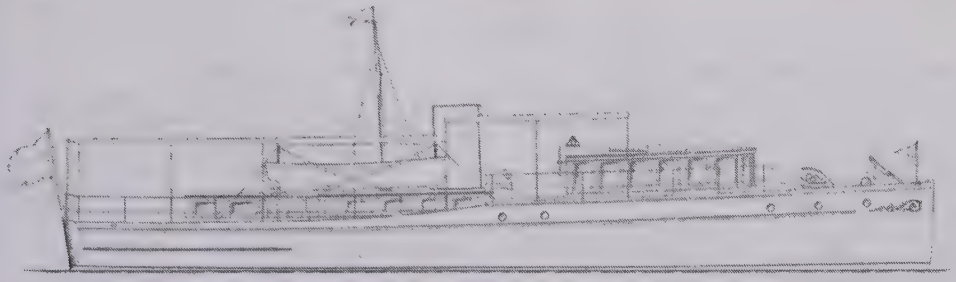
Peg o' My Heart is the name of a 67-foot power cruiser, designed and built this year by F. S. Nock for Wilbur C. Walker, of Hartford. The plans, which are published herewith, show a most attractive vessel with good accommodations. The construction is fairly heavy. The keel is sided 6 inches, the stem 5 inches, the bilge clamps are 2 by 6 inches, the deck clamps 2 by 6 inches, the shelves 2 by 4 inches, the keelson 7 by 5 inches, and



40-Foot Cruiser Teal, Built For Albert Aschaffenburg, of New Orleans



Profile, Arrangement, Sections and Lines of 67-Foot Cruiser Peg o' My Heart, Designed and Built by P. S. Nock

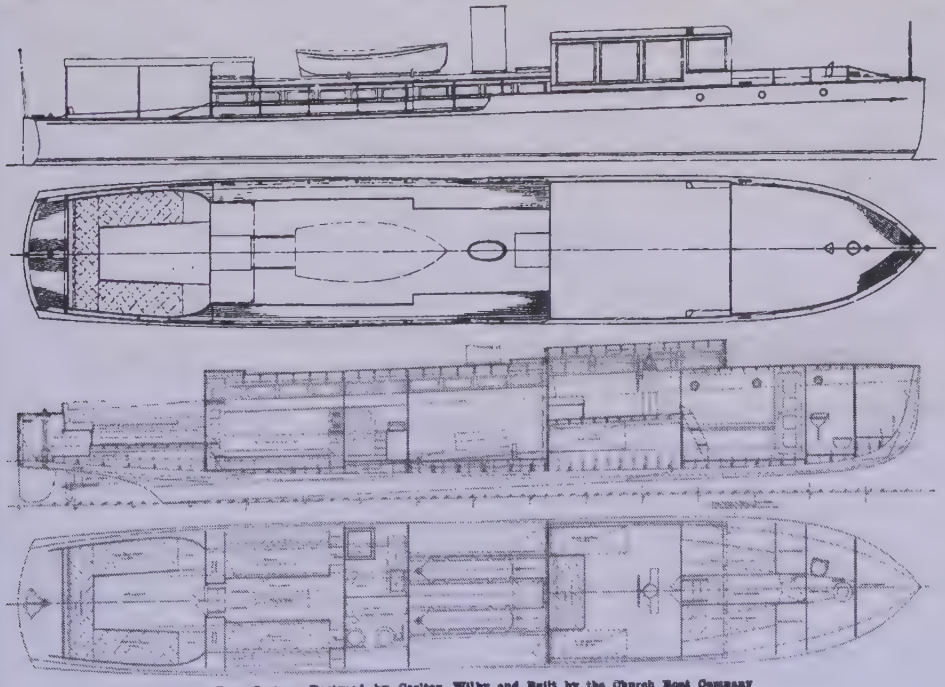


Peg o' My Heart, 67-Foot Cruiser, Built For Wilbur C. Walker, of Hartford, by F. S. Nock at East Greenwich

the sister keelsons 3 by 14 inches. The frames, 2 by 2 inches, are spaced 10 inches on centers and are doubled in the wake of the engine beds. The floors are sided 2 inches.

The crew's quarters are in the forepeak. The dining saloon comes next aft with a galley adjoining. The engine room is under the bridge and aft again is the owner's stateroom and a guest's stateroom. Between these two rooms on the port side is a bathroom, and on the starboard side a companionway leading to the deck. In the forward saloon is a sideboard at the forward end covering the center sash. At the after end there are lockers for chinaware and a stand for a phonograph. The owner's stateroom is arranged with a berth on the port side, bureau desk, lockers, wardrobe, etc. The guest's stateroom has two berths. The general finish of the after rooms is mahogany and white. The deckhouse and all interior brightwork are of mahogany. A 14-foot power tender and a 12-foot rowing tender are carried on davits.

Peg o' My Heart is very attractive in appearance. She has a liberal freeboard forward, thus assuring a dry boat under ordinary conditions of weather. The dining room is in a sunken deckhouse which is well lighted and ventilated by sliding plate-glass windows on all sides. Aft of this house is the helmsman's position and all engine



60-Foot Cruiser, Designed by Carlton Wilby and Built by the Church Boat Company

controls lead to the steering wheel. There is a thwart seat just forward of the stack. This stack is for the ventilation of the engine room and the exhaust. Aft of this is a cabin trunk over the quarters in the after part of the vessel. Peg o' My Heart carries one signal mast. Awnings screen the bridge and the after part of the boat and the general scheme is one of comfort and convenience.

The power plant is a four-cylinder 8 by 10-inch Standard engine. There is also a Delco 32-volt direct-connected generating set. The capacity of the gasolene tanks is 450 gallons and of the fresh-water tanks 200 gallons.

The general dimensions are:

Length o. a.	67 feet
Length w. l.	66 "
Breadth	13 "
Draught	4 "

60-Foot Cruiser for the Lakes

A 60-foot cruiser, designed by Carlton Wilby and building by the Church Boat Co. at Sibley, Mich., shows a most attractive vessel. The crew's quarters are forward. Aft of these is the pilothouse, under which is storage space and the gasolene tanks. Then comes the engine room and after again under a cabin trunk are the owner's quarters. These consist of a main cabin fitted with transom berths with a galley adjoining at the forward end. The cabin is 8 feet long and is fitted with a table, sideboards and lockers, and at the after end between steps to the cockpit are two clothes lockers. The cockpit is 9 feet long and has one seat at the after end and two at the sides.

This yacht will be driven by two six-cylinder, 5½ by 6¾-inch Model F Sterling engines.

The general dimensions are:

Length	60 feet 0 inches
Breadth	10 " 9 "
Draught	3 " 0 "

35-Foot Cruiser

A small cruiser has been designed by William Hand, Jr., and is being built by the Gidley Boat Co. at Penntang, Ont., for C. W. Beatty, of Toronto. This boat has a cabin forward 11 feet 9 inches long in which are two transoms with lockers underneath. Forward of this cabin is a small galley. The engine space is amidships under a bridge. The cockpit is 9 feet 11 inches long and at the after end is a deck 3 feet 9 inches.

This yacht will be driven by a six-cylinder Model F Sterling engine, which will give a speed of 17 miles an hour.

The general dimensions are:

Length	35 feet 4¾ inches
Breadth	9 " 3 "
Draught	2 " 8½ "

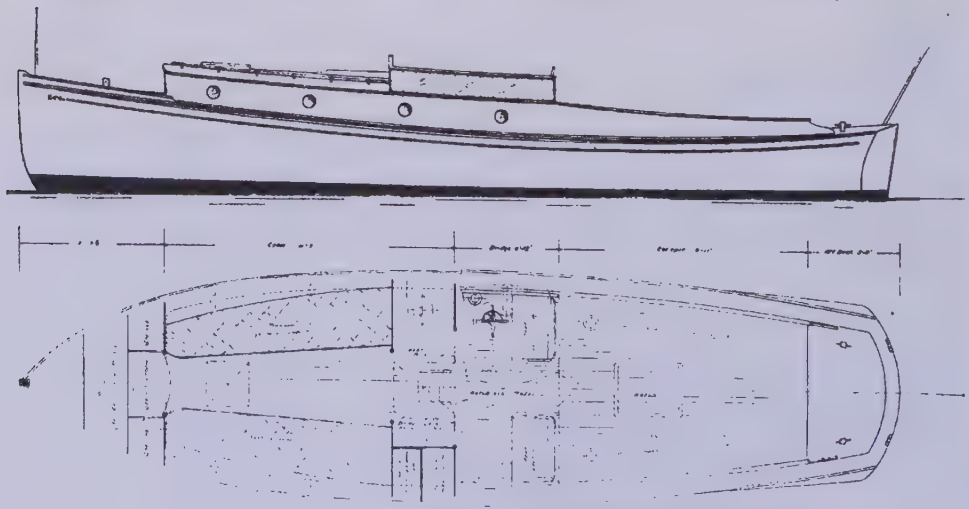
Standard Lifeboat

So many inquiries lately have been made for plans of a standard lifeboat that drawings of one made by George B. Douglas are reproduced herewith. These boats are full bodied, of good carrying capacity and heavily and substantially constructed.

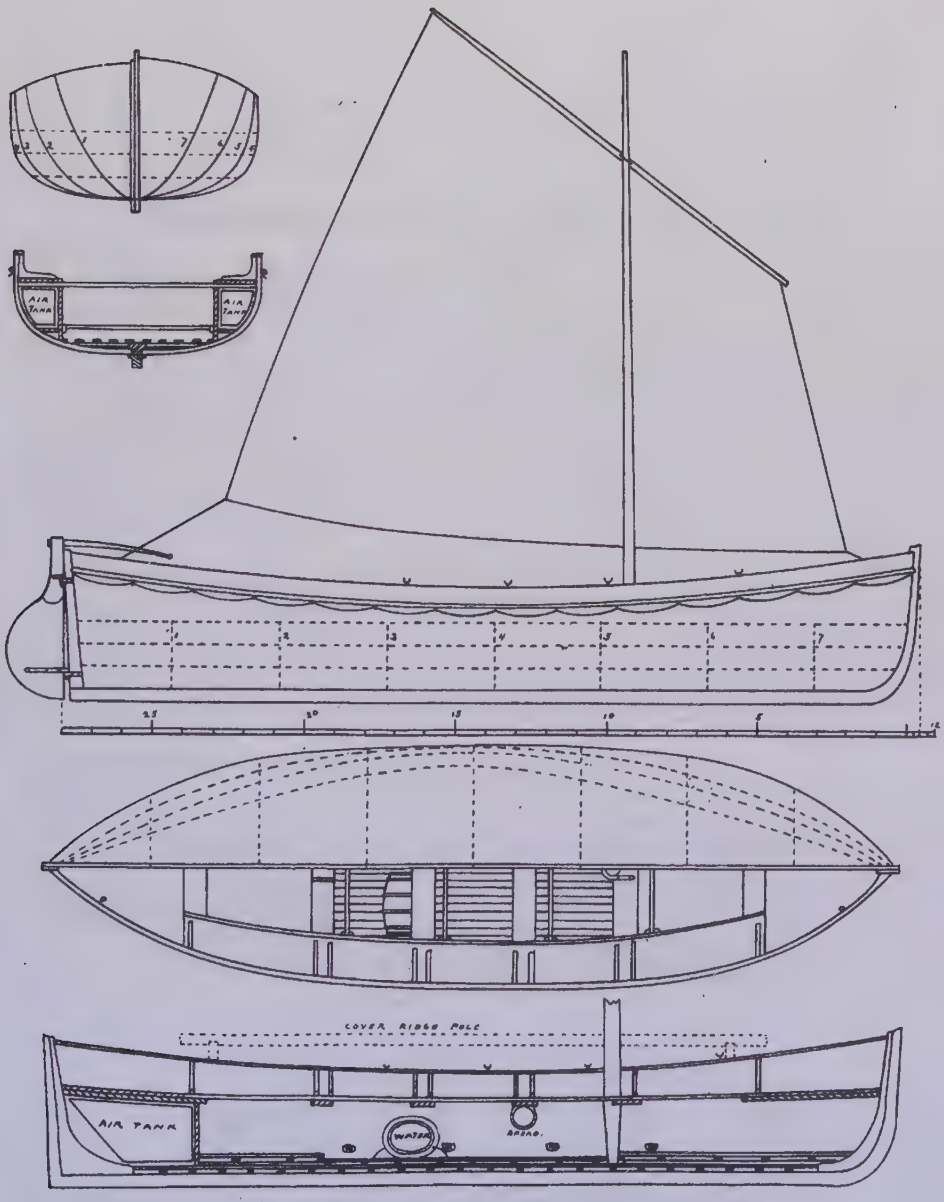
To insure safety air tanks are fitted under the seats along the sides and at the stern so that, even though the boat was swamped, it would not sink and the passengers would still have something to hold on to. For the latter a lifeline is fastened the length of the side. For emergency, there is a water butt secured to the flooring under one of the thwarts, while the grub-box is fastened up underneath another.

Each carries a lugsail which sets on a mast stepped 9 feet from the stem, and this is used in favorable breezes. The dimensions of these boats are:

Length	28 feet 6 inches
Breadth	8 " 0 "
Draught	2 " 9 "



35-Foot Cruiser, Built by the Gidley Boat Company For C. W. Beatty, of Toronto; Speed 17 Miles



Construction Plans of 28-Foot Standard Lifeboat, From Drawings Made by George B. Douglas

Rudder Designing Competitions

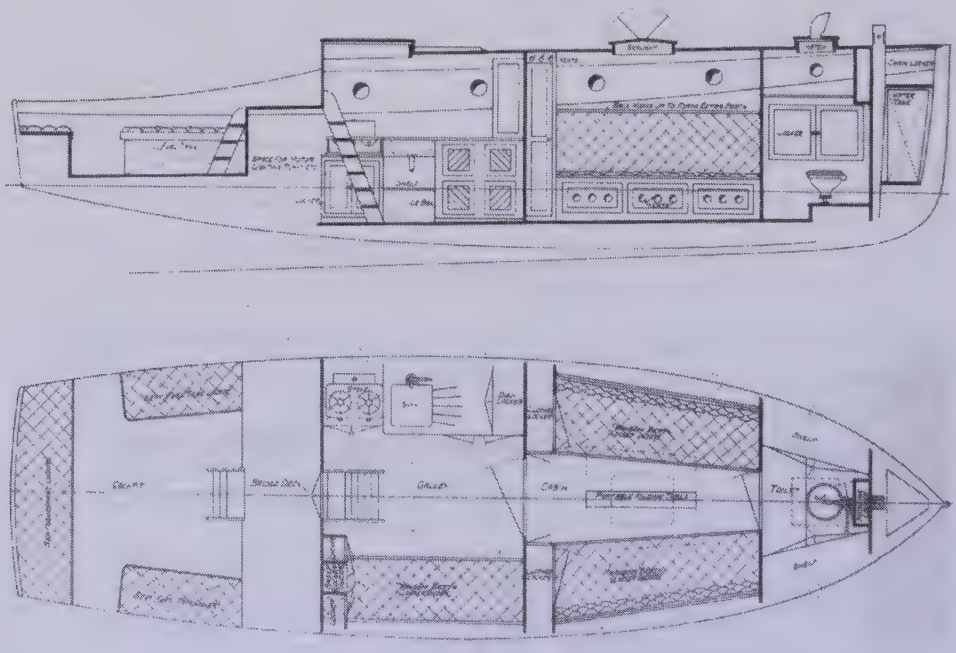
EIGHTEEN plans were submitted in the competition for prizes offered by THE RUDDER for the best interior arrangement for a 30-footer. An outline plan was given, which had to be filled in. The hull of the vessel had a plumb stem and transom stern. The boat was of the raised deck type, the cabin being 20 feet long, and under this the designer was to arrange the accommodations as comfortably as possible and to the best advantage for three persons. The engine is under the bridge deck and the tanks are aft, so that the entire 20 feet was left for the owner's accommodations. The conditions also said that the scheme of ventilation would be considered by the judges.

The plans were nearly all exceedingly good and the judges had to deliberate a long time before the best was selected. They eliminated one after another until only a few were left, and then selected the plan of W. W. Haertel as the best, and placed the plan sent in by Sidney S. Griffes as second best. These two plans are very similar in detail. The galley of Mr. Haertel's plan is on the port side amidships. The stove is placed close to the engine space and this compartment, which is 6 feet 6 inches long, has lots of room where room is needed. A cook cannot furnish a good meal when he has to work in close, cramped quarters. The opposite side of the vessel is occupied by a transom berth, at the after end of which is a clothes locker. There is a good-sized cabin forward of this with transom berths on each side, two clothes lockers and a folding table, and in the bow is the toilet. The plans show good ventilation.

The plan submitted by Mr. Higgins was very similar to the winner. The galley is placed on the starboard side but the quarters are somewhat cramped. The stove is at the forward end and will carry the heat further into the cabin than in the other boat. There is one large clothes closet, and in the main cabin two buffets are fitted at the forward end of each berth.

The third plan, submitted by "Beaver", is also very good; but instead of being divided into two apartments, as in the other plans, it is open from end to end and there is no privacy for anyone. It might be claimed that it is very easy to hang a portiére between across the middle of the cabin, thus dividing it into two rooms. But this was not shown on the plan.

In some of the plans sent there was much crowd-



First Prize Winner in The Rudder Competition For Interior Arrangement of a 30-Footer, Submitted by W. W. Haertel

ing. Some put the galley in the bow and by so doing would have the living quarters between two heats—the engine and the galley stove. These plans will be printed from time to time in THE RUDDER and all will have an opportunity to see how the eighteen designers arranged the 30-foot interior.

Plans were sent in by:

W. W. Haertel, Milwaukee, Wis.
Sidney S. Griffes, Elizabeth, N. J.
H. C. Odyk, Holland
F. W. Wengenroth, Bayport, L. I.
J. L. McKenzie, Hamilton, Canada
William H. Taylor, New Bedford, Mass.
Albert E. Redifer, Cape May, N. J.
Arthur W. B. Wood, Merrick, L. I.
Alvin E. Winscher, Sheboygan, Wis.
T. Curtis Ould, East Orange, N. J.
Roy McMeeken, Sault Ste. Marie, Ont.
Philip T. Marsh, Bayonne, N. J.
Frederick Luhre, Bronx, N. Y.
C. E. Bradley, Fall River, Mass.
A. Malcolm Irwin, Prince Edward Island
Sidney M. Higgins, Seattle, Wash.

One plan was not marked in any way and it is impossible to identify it, and another was marked "Beaver"; but no accompanying envelope can be found which tells who "Beaver" is. This plan was one of the best submitted and almost took a prize.

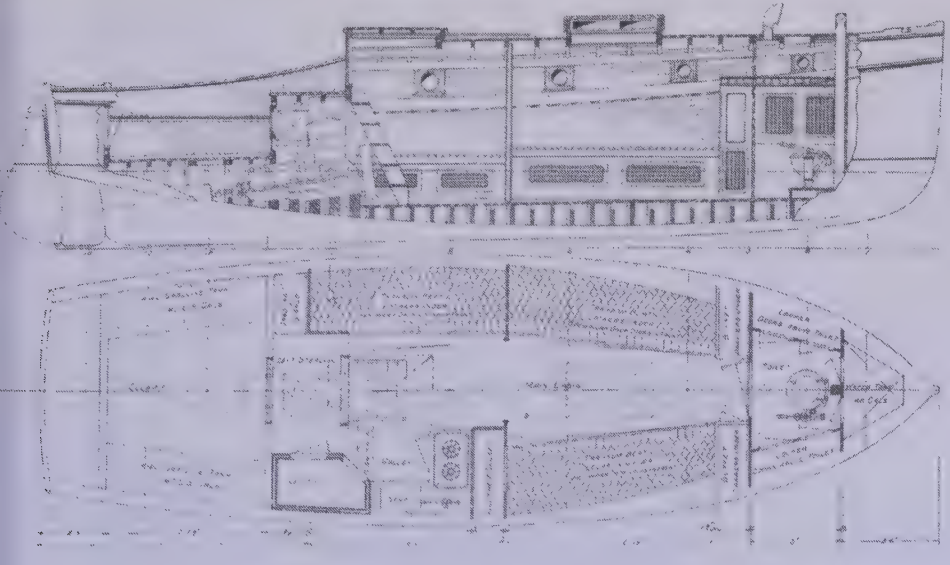
40-Foot Cargo Boat

One very attractive set of plans for a 40-foot shoal-draught cargo boat was submitted by William F. Gilliam, of Oakland, Cal. The plans were well drawn and very complete. The model of the boat, too, was good; but in the arrangement the judges decided an error was made in placing the house in the middle of the boat instead of aft. This arrangement spoiled the deck space and consequently decreased the room for handling the cargo. With the house put aft, as it was in the plans of the successful competitors, this boat would have been placed higher in awarding the prizes.

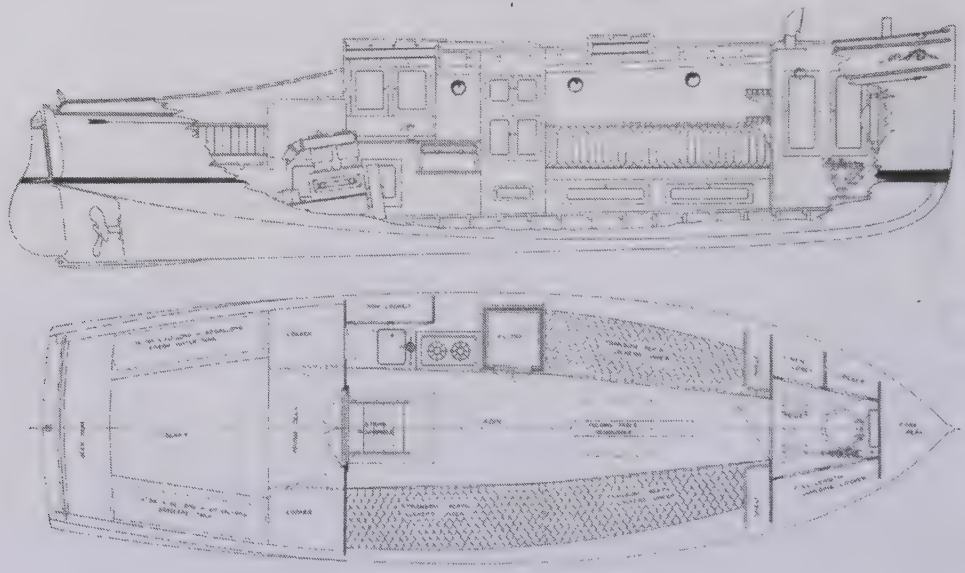
The accommodations on this boat are very complete and have been carefully worked out. There are berths for two men, with a comfortable messroom, a galley and good locker space. Mr. Gilliam also sent in specifications for his design. This was not generally done by those who took part in the competition, but it makes the plans much more interesting to those who study designs and is also of value to those who contemplate building. The specifications are given herewith:

The greatest depth of water required to float this boat fully laden will be 30 inches. Reasonable care must be taken that the deckload is *not* carried too high for safety, as the general form of the hull tends to provide a very stiff hull. To utilize the full of the power developed by the 25-h.p. engine which is installed, a four-bladed propeller, with a diameter of 23 inches, pitch of 33 inches, has been provided which will absorb the power of the engine when turned at 360 r.p.m.

The accommodations as shown by the plans provide quite comfortable quarters for two men, with galley and messroom combined, four-burner coal range, sink, dish racks, storage lockers, and space under table for galley stores. Galley stove vents through stove pipe to deck, passing through asbestos-jacketed deck iron, to Liverpool head type of stack. The cabin arrangement is plainly shown on the plans. The entrance to berths is through pilothouse, the partition between being eliminated. One 2 by 3-inch stud will be placed on center line to stiffen the structure over the opening to berth space.



Second Prize Winner in Accommodation Plan Rudder Competition, Submitted by Sidney S. Griffes

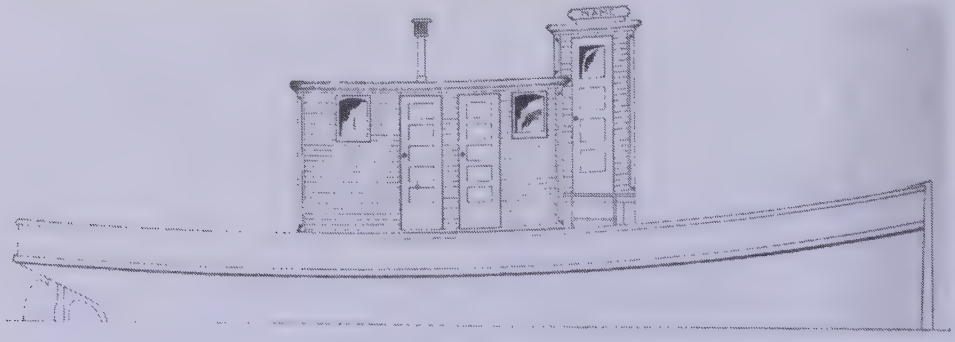


A Well Arranged Interior, Submitted by "Beaver"

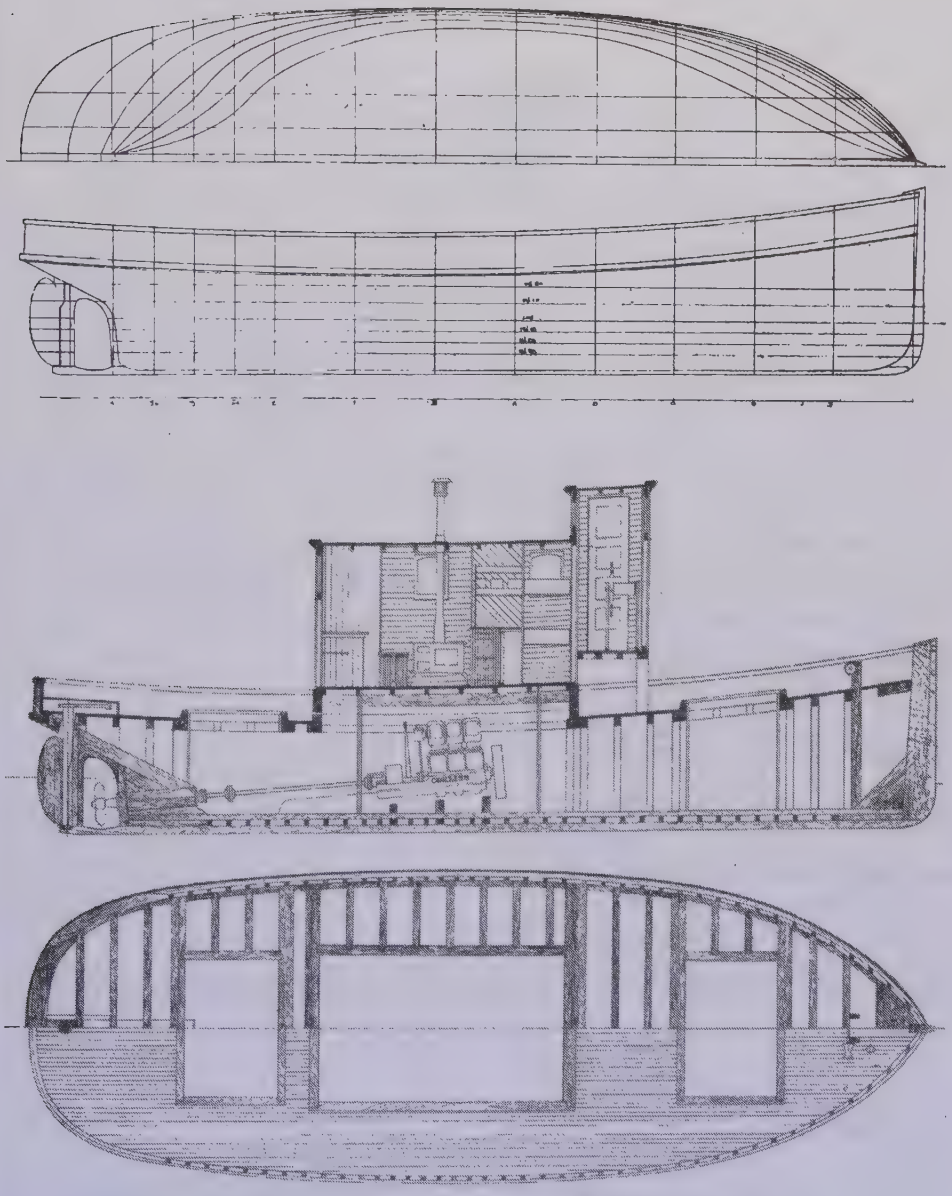
A heavy curtain to hang between berthing space and pilothouse.

The vessel is to be built of materials and sizes as outlined: keel, pine, sided 8 inches, moulded 4 inches; the keelson sided 8 inches, moulded 3 inches; garboards 2¾ by 8 inches; sister keelsons same as garboards. The frame will be of steam-bent white oak (if available, but proportioned to take a poorer grade of oak if necessary) sided 2 inches, moulded 2 inches at head, 3 inches at heel. Laying flat on top of keel, with keelson and sister keelsons laying on, and thoroughly through fastened to, frames and keel. The planking to be 1¾ inches thick, the ceiling to be 2 inches thick throughout. The deck clamp to be of pine, 3 by 4 inches, fastened into guard with drift-bolts spaced close. Guard to be cut from 3 by 4-inch pine. Rubbing strake for guard to be of ironbark 1 by 3 inches in size. Deck beams of pine, 4 by 4½ inches. Deck plank of vertical grain (if available) pine 1⅝ by 2½ inches. Bilge keels will be placed each side so that the vessel may lay on beach if necessary to load or discharge cargo, the weight resting on keel and bilge keels, which will be 4 by 5 inches, tapering out to thickness of planking at end, when they will terminate at ends of ship as hull planks. To fasten directly to frames, and to inside clamps of same dimensions as shown on plans, through bolted. The house framing will be as light as possible in order to keep the center of gravity of hull as low as possible. Fastenings to be of galvanized iron.

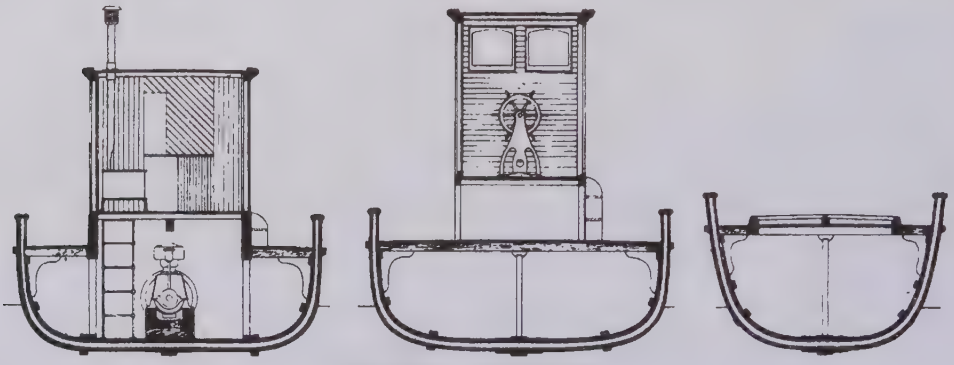
The engine specified is one made by the Standard



Profile of 40-Foot Shoal-Draught Cargo Boat

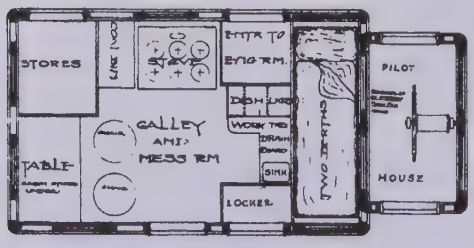


Lines and Construction Plans of 40-Foot Shoal-Draught Cargo Boat, Designed by William F. Gilliam



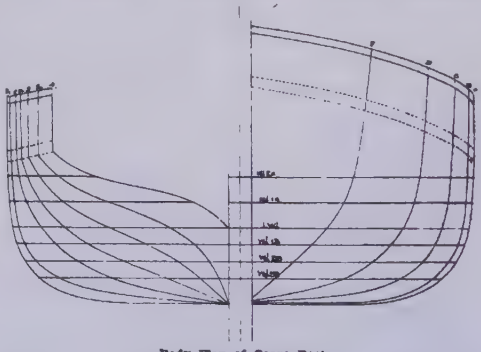
Section Plans of 40-Foot Cargo Boat

Gas Engine Company, of Oakland, Cal., and is equipped to operate on kerosene, distillate, and other cheap fuels. It is of the commercial heavy-duty type turning at low speed. A lighting plant such as the Dayton is recommended, to be operated from the engine flywheel. The



Cabin Arrangement of 40-Foot Cargo Boat

fuel tanks will be placed one each side of the engine. There will be ample space for stores, supplies, etc., in the engine space. The designed speed is a little better than 7 knots per hour with the engine turning at 300 r.p.m. The boat will be fairly good in ocean service where reasonably fair weather conditions prevail. She is not intended for bucking heavy weather. Sufficient



Body Plan of Cargo Boat

cargo can be carried to make her a very profitable investment. She should be built complete for about $4,000.



Debate Ended—Now Build Ships

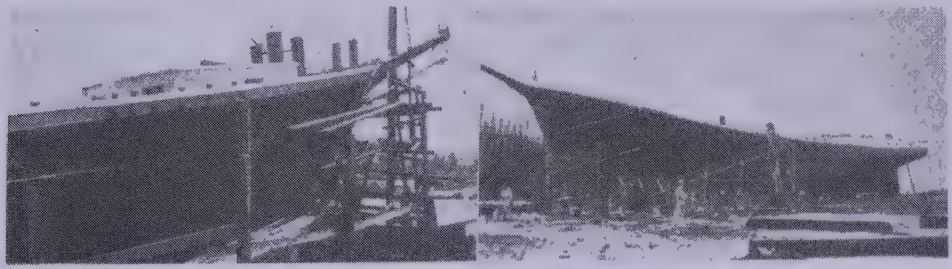
THE Shipping Board muddle has been straightened out by the President. He broke the deadlock between William Denman, the chairman of the Shipping Board, and Major-General Goethals, general manager of the Emergency Fleet Corporation, by accepting the resignation of General Goethals and asking for the resignation of Mr. Denman. He also accepted the resignation of John B. White, a member of the Board. The President then appointed Edward N. Hurley to succeed Mr. Denman as chairman of the Board, Rear-Admiral Washington L. Capps to succeed Major-General Goethals, and Bainbridge Colby to succeed Mr. White.

Major-General Goethals had worked out the scheme to build steel cargo vessels by standardization fabrication methods and had succeeded in enlisting the services of the big steel companies so that the vessels could have been built very speedily. Unfortunately, he ran foul of the interests of Chairman Denman who, with J. B. White, of Kansas City, and other members of the Shipping Board, was closely allied with the lumber interests and bent all his influence to have wooden vessels built in spite of the opposition of the big naval and marine engineers in the country. General Goethals did big work but his hands were tied, and like a good soldier he placed his resignation in the hands of the President. In his letter, after briefly reviewing the situation, he said: "The necessity for shipping makes it imperative that results be secured as rapidly as possible. It is results, by whomsoever obtained, which count after all and nothing should be allowed to interfere with the accomplishment of this end. I have endeavored to obtain harmonious relations with the Shipping Board but regret to state that I have not succeeded and it seems impossible to secure the unison of purpose essential to the success of the work. * * * I am convinced, therefore, that the best interests of the public welfare would be served if I were replaced by some one on whom full authority can be centered and whose personality will not be a stumbling block. It is my urgent hope that this solution will commend itself to you, and, in order that the work may be delayed as little as possible by the change, if you deem it wise, I shall be glad to continue in charge until my successor can be selected, and remain with him until he has a thorough knowledge of the organization that has been built up and is able to familiarize himself with the work that has already been undertaken."

Replying to this the President wrote, in part: "Your letter of July 20th does you great honor. It is conceived in a fine spirit of public duty, such as I have learned to expect from you. * * * It is with that fact in my mind that I feel constrained to say that I think that you have interpreted your duty rightly. No impartial determination of the questions at issue can now set the shipbuilding program promptly and effectively on its way to completion and success. It is best that we take the self-forgetting course you suggest and begin again with a fresh sheet of paper—begin not only the shipbuilding but the further administration of the program. The ship-building is, happily, in large part begun and can now readily be cleared of debates that have unquestionably darkened it. With deep appreciation, therefore, of your generous attitude and with genuine admiration of what you have been able in short time to accomplish, I accept your resignation and feel that in so doing I am acting upon your own best judgment as well as my own."

Edward Nash Hurley, who succeeds Mr. Denman, because of his extraordinary grasp of business was named as a member of the Federal Trade Commission in 1913. He is a business man and not a politician. He has risen from an engineer on the Burlington Railroad to the ownership of one of the biggest manufacturing concerns in the Middle West by hard work and sheer business ability.

Rear-Admiral Washington L. Capps is largely responsible for the development in the American Navy of the present battleship. While Chief Constructor during the Roosevelt Administration he evolved the all-big gun ship and secured its adoption in spite of protests by line officers. He is also responsible for the skeleton mast, a distinctive feature of all American battleships. Admiral Capps was born at Portsmouth, Va., January 31, 1864. He graduated from the Naval Academy in 1884 and served on the U. S. S. Tennessee from 1884 to 1886. He was appointed assistant naval constructor in 1888 and then went to the University of Glasgow, where he graduated with a degree of bachelor of science in 1889. On his return to this country he was assigned to Cramps Yard and later to the New York Navy Yard.



Two Views of 225-Foot Auxiliary Schooner Building From Designs by Cox & Stevens. (The Lines and Description Are to be Found on Page 601)

From 1892 to 1898 he was superintendent of construction for the Navy at the Union Iron Works. During the Spanish War he was on Admiral Dewey's staff on special duty. Then he was on the Board of Inspection and Survey, in 1893 was head of the construction department of the New York Navy Yard, and in October, 1903, was appointed Chief of the Bureau of Construction and Repair. In 1910 he was made Chief Constructor, with the rank of Rear-Admiral. In 1912 the University of Glasgow conferred upon him the honorary degree of doctor of science.

Bainbridge Colby is a lawyer of New York City. He has been identified with the Progressive party. In 1912 he was a candidate for Governor of New York and in 1914 for the United States Senate.

As soon as the new board was organized the members gave careful study to the situation. It was feared by the wooden ship men that Admiral Capps's appointment spelled the doom of those vessels, but such has not been the case. He is a steel man, but he realizes that steel and wooden vessels can be built and built quickly, and so those builders who can show him that they can do the work and do it well and promptly will get contracts. Then the steel ship men too were somewhat fearful because they figured that Admiral Capps, being a Navy man, where strength and solid construction count for so much, might not favor the standardized methods favored by General Goethals. It is admitted that vessels built in this way will not come up to the requirements of Lloyd's but while they will fall short of this they will be strong, seaworthy, and will fill the want for ships quickly. Admiral Capps has not made many announcements of what he is doing, but those that have been made indicate that he will closely follow the program laid out by General Goethals which was held up by Chairman Denman and caused such a big waste of time.

On August 3d Admiral Capps sent a telegram to the owners of all American shipyards, commandeering all power-driven cargo-carrying and passenger vessels of about 2,500 tons deadweight capacity under construction. The builders are to furnish plans and specifications at once.

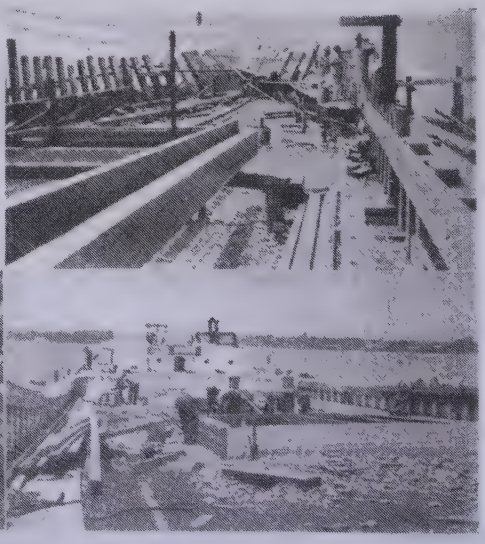
Since the Shipping Board was organized contracts for about six hundred new ships, having a capacity of more than 2,500,000 tons, have been placed. Shortly before General Goethals resigned he said that contracts for three hundred and forty-eight wooden vessels and seventy seven steel vessels had been placed. These were to have a capacity of 1,860,800 tons and to cost $275,660,000. A few days later he placed contracts for seventy-five more wooden ships, and on August 11th the Board approved contracts for fifty, and this number has since been increased. These new vessels will begin to be valuable in about five months. In the meantime the Government has the one hundred and one seized German vessels, which are rapidly being put into shape for service. Nearly three hundred vessels building have been commandeered and these will shortly be coming into service.

Admiral Capps has conferred with representatives of the Electric Boat Corporation and the American International Company of Philadelphia. These are the two concerns that have planned to build steel vessels and turn them out in large quantities and very rapidly. The plants for these two concerns are already being erected, one on Newark Bay, opposite Bayonne, and the other on the Delaware River. An announcement of an agreement by which the shipbuilding work is to be started at once may be expected at any time. In the meantime shipbuilding yards are growing fast and new companies are constantly being organized.

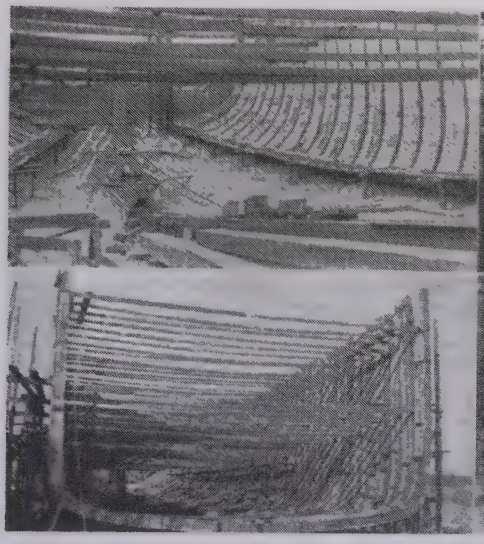
Ships and more ships will be needed as fast as they can be built for a long time to come. Not only are they needed to successfully bring the war to an end, but they will be needed after the war is over to carry the commerce of the world. England is bending every energy to supply ships. Premier Lloyd George recently announced that in the present year 4,000,000 tons of new ships would be turned out from the British yards. They are using standardized methods there and the first vessel, one of 8,000 tons, was recently launched, the first to be built of this class. Japan, too, is building ships, and the neutral powers are also doing all they can to



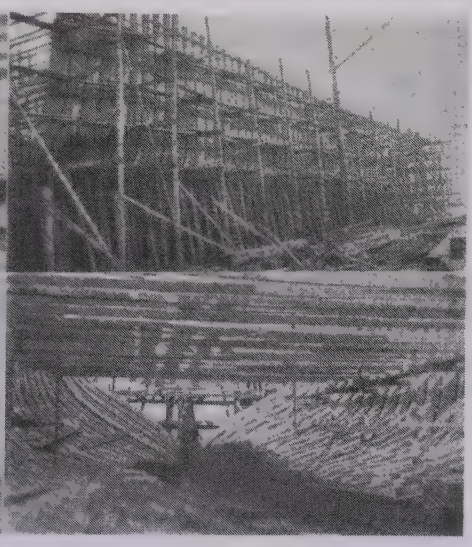
Showing Waterways in Main Deck Forward of Auxiliary Schooner



View of Main Deck, No. 1 Hatch From Forward House Looking Aft



Interior View, Laying Inside Skin
End View of Framing



View of Framing, Port Side
Interior View Looking Aft

keep ahead of the havoc the German submarine is creating in the shipping world.

Admiral Capps is thoroughly familiar with the submarine situation and he knows better than anyone else what type of boat and what speed is necessary to get through the danger zone. A very interesting table of losses by submarine was prepared recently, which showed that the losses among vessels that could make 17 to 20 knots were comparatively small, while the greatest losses were among vessels of 10 to 15 knots. Slow-speed vessels are easy prey for the submarine. The submarine can overhaul them without coming above the surface, while the boats with the higher speed can outspeed the submarine even when it is running on the surface. This shows that safety lies in speed and the new boats must have speed to get them safely through the zone. To guard the zone high-speed destroyers are necessary, and with cargo vessels of 15 knots or better and a large fleet of destroyers the submarine menace should be curbed.

The continuation of the article on "Building Slips and Launching Ways" is printed herewith. It is one of a series prepared by Charles Desmond, and will form part of a book on wooden ship construction which will shortly be published by THE RUDDER.

Building Slips and Launching Ways

PART II—(*Concluded*)

THE launching apparatus may be divided into two principal parts—the launching ways and the cradle or temporary framework which slides down the launching ways and supports vessel during its movement down the ways. The launching ways consist of two continuous runways of hard wood (oak, maple or hard pine), planed perfectly smooth and laid at such an inclination that vessel will move freely down the ways as soon as she is free to do so. If the inclination of launching ways is greater than inclination of building slip floor, the ways must be securely supported on blocking or cribbing placed on top of slip foundation timbers. Of course the launching ways must be securely fastened and shored to prevent them moving sideways or lengthways during launching.

The determining factors for inclination are:

1st.—The weight of vessel. The smaller the weight the greater the inclination should be.

2d.—The speed in feet per second that vessel is wanted to move at during launching. The available width of channel and depth of water where vessel will take the water must be carefully considered and a launching speed selected that will be sufficiently great to insure that vessel will take water properly and not so great as to cause vessel to travel too great a distance after she is water-borne.

In practice it has been found that one-half inch to a foot is a dangerously slow inclination for even the largest vessels.

Five-eighths of an inch to the foot will give a moderate and easily controlled safe launching speed for vessels weighing between 800 and 1,200 tons.

An inclination of three-quarters of an inch to a foot will give a good, safe, free launching speed for moderate weight vessel, or a speed that will be sufficient to insure freedom from danger of sticking, and if there is sufficient width of channel to allow this inclination it is an excellent one to select.

Seven-eighths of an inch to a foot will deliver a vessel into the water at a high rate of travel and should not be used except in cases when it is necessary that vessel move very fast, or there is a danger of the weight of vessel forcing the lubricating grease out from between the launching and sliding ways.

The following particulars of launching speeds will prove of value as a guide:

TABLE OF LAUNCHING DATA

Length of Vessel in Feet	Launching Weight in Tons	Inclination of Launching Ways per Foot. Inches	Launching Speed Feet per Second
200	250	5/8	12*
225	350	3/4	15
250	560	9/16	15
275	675	5/8	16
310	875	5/8	17
325	1,200	9/16	16
350	1,800	9/16	18

*Too slow.

A velocity of 12 feet per second is very slow; one of about 15 feet per second is a good speed to use in cases where it is desired to control the launching or stop vessel gently; 16 to 18 feet per second is an excellent speed for use when width of launching channel is sufficient to allow vessel to move a little distance out before being stopped.

Above 18 feet per second should not be used unless there is ample room for launching or it is necessary to have vessel move very swiftly down the ways.

BREADTH OF SURFACE OF LAUNCHING WAYS

The width of surface of launching ways must always be proportioned to weight of vessel because the whole of launching weight of vessel must be carried on launching ways, and if weight per unit of surface is too great the lubricating materials placed between launching and sliding ways will be forced out and vessel may stick on ways.

The width of launching ways should be such that maximum pressure on each square foot of surface that is beneath the sliding ways does not exceed 2½ tons.

Suppose, for instance, that launching weight of a certain vessel is 800 tons, the length of launching cradle surface that will bear on ways is 200 feet, and we desire that pressure per square foot during launching does not exceed 2 tons.

As there are two launching ways the weight each must support is 400 tons, and as length of each sliding way is 200 feet a surface of 2 feet is sufficient to carry the weight without exceeding the named pressure per square foot.

DISTANCE TO PLACE LAUNCHING WAYS APART

A distance of about one-third the extreme breadth of vessel from center to center of ways, measured at their upper end, will give excellent results for vessels of ordinary form of cross section. The lower end of ways must be 2 or 3 inches further apart than the upper ends, this increase of distance being necessary to take care of the slight spreading of cradle that occurs when weight of vessel is transferred from keel blocks to cradle, and to insure that the cradle will move freely down the ways.

In addition to this, the upper surfaces of the launching ways should be inclined inwards about ½ inch to a foot for the purpose of reducing the danger of ways being forced outwards when weight is transferred to them.

When a vessel moves along the launching ways there is always a tendency to slide sideways, as well as towards the water, the side tendency being due to the outward pressure on bilge ways which is always present, though not dangerous unless it should happen that one of the launching ways is placed slightly higher than the other or the bilge blocking of cradle is not wedged up alike on both sides. Perfection in these matters cannot be obtained, so, by giving the ways a slight inclination of surface inward, and spreading them a little at the lower ends, danger from these two causes is reduced to a minimum.

I will now illustrate and explain the launching apparatus used when launching a moderately sized vessel stern first.

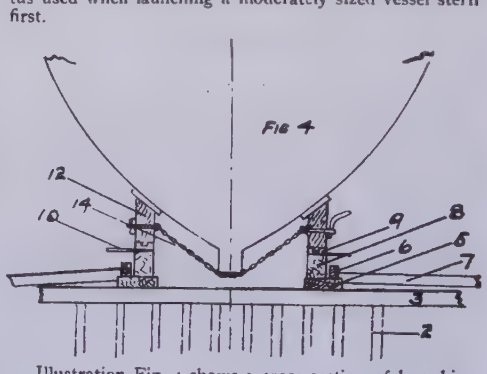


Illustration Fig. 4 shows a cross section of launching apparatus placed in position under vessel. I have selected a section through one of the forward sections and show the vessel resting on cradle.

Illustration Fig. 5 shows longitudinal view of same vessel and one side of cradle in position ready to wedge up.

DESCRIPTIVE EXPLANATION OF FIGS. 4 AND 5

No. 1 indicates top of slip floor (already described).

No. 2 indicates supporting piles (already described).

No. 3 indicates athwartships caps placed on piles (already described).

No. 4, keel blocking upon which vessel rests during construction (already described).

No. 5. *Launching Ways* placed in position for launching.

No. 6. *Launching Ribbands* that run full length of launching ways to prevent the sliding, or bilge, ways from sliding sideways. These ribbands are strips of oak or hard wood bolted to launching ways. The butts of ribbands should not coincide with butts of launching ways.

No. 7. *Ribband Shores* placed at frequent intervals along outside of launching ways. Their use is to hold launching ways in place and prevent the ribbands being torn off. Note that one end of shores rests partly against ribband and partly against launching way, and the other is firmly braced against side of slip or piles driven into ground for that purpose.

The abovenamed pieces form the lower line of supports and are the fixed portion of the launching apparatus.

The upper, or movable, portion of the launching apparatus forms a cradle for the vessel to rest in and a carriage that will glide smoothly along the launching ways and convey vessel from the slip to the water.

No. 8. *Sliding*, or *Bilge, Ways*. These are oak, or yellow pine logs that rest on launching ways. Two or more logs are required on each launching way, and the surface that rests on launching ways must be planed perfectly smooth, and ends of each log slightly rounded to prevent their catching in launching ways should there be a slight irregularity at any joint. The pieces of sliding ways butt against each other and are usually fastened together with rope, or chain lashings passed through holes bored in ends of each piece. The sliding ways form a base for the cradle upon which the whole weight of vessel is carried while being launched. The length and width of sliding ways must be such that pressure on their under surface does not exceed 2½ tons per square foot. The sliding ways must be slightly longer than cradle and should not be less than three-quarters of the length of vessel. The lubricating material is placed between launching and bilge ways. Note that when vessel rests on cradle the outer edge of bilge ways does not bear hard against the launching ribbands. There is about ¾ inch between.

No. 9. *Sole Piece*. Planks of hard wood that extend from end to end of cradle to form a bearing surface for the large wedges that are used to raise vessel off keel blocks immediately before launching. The sole piece planks are fitted so that when their inner edge rests firmly upon the sliding ways the outer edge is about ¾ inch open. This opening is for the purpose of giving a good bearing surface for the wedges. The sole piece planks are made the width sliding ways.

No. 10. *Slices*, or *Large Wedges*, placed between sliding ways and sole piece planks.

No. 11. *Packing* or *Filling*, that fills space from top of sole piece plank to bilge along the middle length of vessel. The quantity and length of this filling depends upon shape of vessel. This filling is the width of sole plank.

No. 12. *Poppets* are upright pieces of timber placed abaft and before the packing. The packing extends forward and aft to points where the distance between bilge and sole plank becomes too great for the use of solid packing. From these points bilge of vessel is supported by means of logs of timber, called poppets, which are placed about 15 inches apart and stand upright or at a slight rake. The lower ends of poppets rest upon the sole planks and their upper ends against planks that are fitted snugly against the vessel's planking, and both ends of poppets are securely fastened to these planks and held in position by cleats, bolts and tenons. You will note that the extreme forward and after poppets stand at a rake. This helps to resist the upsetting tendency.

No. 13. *Poppet Ribbands*. The poppets are held together, fastened to the packing, and braced longitudinally by pieces of planks called poppet ribbands. One is generally placed near bottom and one near top of poppets, though when poppets are short a single wide ribband is sufficient. The ribbands extend well onto the packing, are let into both filling and poppets and securely fastened with bolts, thus tying filling and poppets together and making one firm structure, longitudinally, of each side of cradle.

No. 14. *Poppet Chains*, or *Lashings*. To prevent the upper ends of poppets working outwards when weight of vessel is transferred to cradle, chains are passed under the keel of vessel, one end of each chain being fastened to a poppet on one side of vessel and the other end fastened to corresponding poppet on the other side. The number and size of chains to use depends upon size and shape of vessel's underbody. The greater the deadrise the greater the tendency will be for the hull to wedge cradle outwards and therefore the greater the number of chains required to keep cradle in place. For a vessel of moderate size with normal deadrise there should be at least two chains secured to forward poppets, two to ends of packing and two to the after poppets. Of course the chains must be brought up taut against under side of keel before they are fastened, and it is always advisable to place a piece of hardwood packing between chain and keel to prevent chain cutting into keel when strain is put on chains during launching. Very often it is advisable to make one end of each chain fast with a removable pin extending above water, thus insuring that the chains can be quickly loosened and cradle separated should it be found difficult to remove cradle from under vessel after she is afloat.

No. 15. *Dog Shore*. This is a shore that prevents the sliding ways and cradle moving between the time vessel is raised off keel blocking and time of launching. This shore is placed at the upper end of ways, its lower end resting against the launching ribband (6) and its upper end against a cleat securely fastened to the side of sliding ways. The under side of the cleat that is fastened to bilge ways *must* be kept well above the top of launching

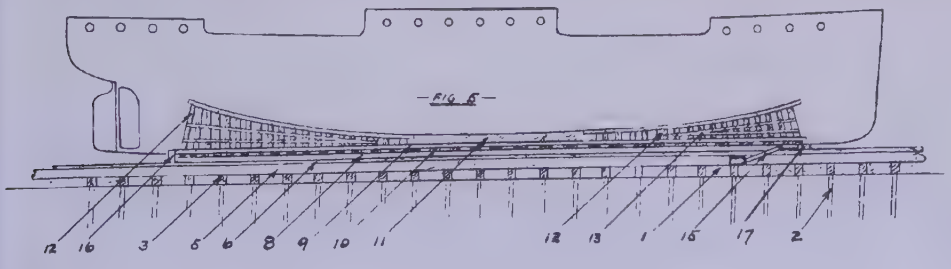


FIG 5

ribband, because it must pass over and clear of ribband during launching.

No. 16. *Sole Piece Stops.* These are pieces of hard wood bolted to sliding ways for the purpose of preventing side and end movement of sole piece planks. The top of these stops must be a sufficient distance below top of sole piece plank to enable wedges to be driven.

No. 17. *Holes* bored in ends of sliding ways to receive ropes which are led on board to secure bilge ways when they float after vessel is launched.

I will now briefly describe the preparations for launching a vessel.

The launching ways are first set in position and secured, then ribbands and ribband shores are placed and fastened. When placing launching ways it is well to bear in mind that if their upper surface is given a camber of about 2 inches per 100 feet of length the danger of vessel sticking, should ways settle, will be greatly lessened.

Next the sliding ways, sole pieces, sole piece stops, packing, poppets and poppet ribbands are fitted in place, and poppet chains, lashings, wedges, and dog shores got ready. Everything is fitted and fastened properly, and ropes or chains for removing cradle from under vessel after she is afloat are led and arranged. For this purpose wire ropes or chain, of sufficient length to extend from upper end of building slip to the point in water where vessel will be fully water-borne, are fastened to upper ends of bilge ways, the other ends of ropes being fastened to an anchor or piles set into ground at upper end of slip.

These ropes or chains are led inside of the sliding ways and stopped up out of the way with rope yarn. As the ropes are only sufficiently long to allow cradle to move freely until vessel is water-borne, they will stop the cradle when that point is reached, and as the vessel can still continue to move she will leave the cradle and thus allow it to float clear.

When everything is fitted and fastened properly, the cradle is removed from under vessel and sliding ways are turned bottom side up and clear of launching ways. The surfaces of launching ways and sliding ways are next thoroughly covered with tallow and soft soap; the tallow being to fill the pores of wood and give it a smooth surface, and the soft soap to lubricate the surface. Oil is added to the soap to insure more perfect lubrication. Several coats of hot tallow are applied, time being given to allow each coat to soak well into the wood.

The sliding ways are next placed back in position and the exposed surfaces of launching ways covered with boards to protect the tallow and soap from dirt until time of launching arrives.

The dog shores are next placed and secured and additional temporary stops placed against lower ends of ways.

Next the pieces of cradle are put back into position and refastened, and ends of wedges entered between sole plank and sliding ways and driven up until the cradle rests firmly against hull.

The poppet chains and lashings are now placed and everything prepared for transferring the weight of vessel from keel blocking to cradle.

The weight of vessel still rests upon the keel blocks and should rest there until immediately before the time set for launching, when gangs of men are arranged along each side of vessel, and at a given signal the wedges are driven home evenly and weight of vessel gently transferred from keel blocks to cradle. Every other keel block and bilge shore is first removed and blocking moved clear of keel, and when this has been done the wedges are again driven and the remainder of keel blocks and shores are taken down.

The whole weight of vessel now rests on sliding ways and the vessel should be released as soon as possible, because if launching is delayed there is danger of the pressure due to vessel's weight forcing the tallow and soap out from between the ways and thus reducing its lubricating value.

The temporary stops are removed immediately after the men are clear of the bottom of vessel, and then, by simply cutting or releasing the dog shore, vessel will be free to move by its own gravity toward the water.

In all cases it is well to make provision for starting vessel, should she refuse to start immediately the dog shore is released. For this purpose air or hydraulic rams, jack screws, or balks of timber handled by gangs of men can be used. The most important thing to remember is, never to delay a moment if vessel refuses to start, and to make sure that the rams, screws, or balks of timber are applied simultaneously and with equal force to each side of vessel.

Of course proper provisions must be made for stopping vessel when she is afloat. This is usually done by means of drags, weights or anchors operated from on board the vessel.

Concluding Remarks

In all cases it is necessary to insure that damage will not result to hull from excessive strains that occur during launching. The easiest way to do this is to place shoring inside of hull near the places where excessive strains are likely to arise.

As vessel enters the water, the water that surrounds it exerts a supporting force that will lift stern clear of ways just as soon as the total buoyancy becomes greater than the total weight. If the length of ways is sufficient to support the whole length of cradle until buoyancy of water acting on immersed portion of hull is sufficient to lift vessel clear of cradle there will be no tipping moment, but the force of buoyancy will cause a great pressure on the fore poppets and portions of hull and ways that is nearest to them, and if the structure of poppets, hull and ways is not sufficiently strengthened at this point one of three things may happen:

Either the ways may spread out;

Or the fore poppets may collapse;

Or the hull may be forced in and severely strained.

If, however, the ways are so short that the longitudinal C.G. of hull and cradle weight will pass beyond their ends before buoyancy is sufficient to cause a lifting moment in opposite direction, there will be a tipping moment, and it is clear that the ends of launching ways will become a fulcrum, and if they are not sufficiently strong to support the strain and weight caused by tipping, the ways may give way or they may spread out. If the ways are able to stand the strain and the inclination of ways and depth of water is sufficient to allow vessel to sink deep into water before lifting, the bow of vessel may lift clear of cradle and immediately afterward the up force of buoyancy may be sufficiently strong to bring the bow down onto the launching ways with considerable force. So in this case also it is necessary to insure against damage to hull by placing internal shores and braces along the portion of hull that is near to fore poppets.

(*The End*)

Naval Reserve Activities

A CHANGE is contemplated in the Navy Department which will alter the whole system of the Coast Patrol or the Naval Coast Defense Reserve. It is probable that if present plans are carried out the men who have enlisted in Class 4 will be transferred to Class 2, or mustered out of the service and left subject to draft. Last year when the Naval Bill was passed and became a law it provided for a Naval Reserve which was divided in six classes: Class 1, the Fleet Naval Reserve; Class 2, the Naval Reserve; Class 3, the Naval Auxiliary Reserve; Class 4, the Naval Coast Defense Reserve; Class 5, the Volunteer Naval Reserve; Class 6, the Naval Reserve Flying Corps. Those who enrolled in any of these classes obligated themselves to serve in the Navy in time of war. The Fleet Naval Reserve is for former officers of the Navy and for enlisted men who have served one four-year term. Class 2, the Naval Reserve, is for men between the ages of eighteen and thirty-five years who have been engaged in the seagoing profession, and to be appointed an officer one must have had two-years' sea experience. Class 3, the Naval Auxiliary Reserve, is the same as Class 2, except that the Department has selected certain vessels which it regards as particularly serviceable in time of war, and the officers on these vessels are enrolled in Class 3.

Class 4 is the Naval Coast Defense Reserve, in which so many yachtsmen and men who have been engaged in fishing or other sea service have enlisted. They have enrolled for such service with coast defense vessels, torpedo craft, mining vessels and patrol vessels, or as radio operators. Owners of yachts could enroll in this class and if they passed certain examinations obtain commission rank. A member of Class 4 cannot be called on for service in the active or reserve fleet, and it was announced that it was not the intention of the Navy Department to call on men for service except in the Naval District in, and for the duties for which, he had enrolled. Anyone enrolled in Class 4 may be transferred to another class if he volunteers.

Before this country was in the war, Assistant Secretary of the Navy Franklin D. Roosevelt toured the country and asked owners of yachts and other vessels to enroll them, and he asked yachtsmen, fishermen, towboat men and others to enroll in Class 4, the Coast Defense Reserve. He asked for several thousand boats, one thousand in the Third District, of which New York is the head, and he asked for many thousand men to handle these boats. He pictured how defenseless the coast was and how easy it was left a mark for the German submarine. The Naval Training Association, with the Navy Department, entered heartily into the work of obtaining the men and the yachtsmen and others turned over the vessels. At the time it withdrew from active work the Naval Training Association had secured 30,000 men for the Coast Defense. Several hundred vessels have been fitted and manned and are now on patrol duty. Several steam yachts and larger vessels have crossed the Atlantic and are chasing the submarines in European waters, and many of these vessels are manned by men who enrolled in the Fourth Class but who later were asked to volunteer for foreign service.

The Navy needs men. The crews of the battleships have been depleted to put gunners on merchant vessels and to put in commission all the torpedo-boat destroyers. Work is being rushed on the destroyers now building and more men will be needed as they are completed, so it is planned to disband Class 4 of the Naval Reserve. Those now enrolled will be asked to volunteer for Class 2 or for the regular Navy, and if they decline they are to be mustered out and to be left to take their places in the draft.

There has already been considerable grumbling among the men in Class 4 because they have been asked to volunteer to serve in Class 2, in spite of the fact that they have not had the two-years' sea service required. Representatives of the Department have boarded the patrol boats. The crews have been mustered aft and these representatives have made strong appeals to the men's patriotism and urged them to volunteer. In some instances the men have had nerve enough to refuse, saying that they gave their services at a time when strong appeals were being made for men in the reserve. By so doing their plans have been upset and that now they expect the Navy Department to live up to its contracts with them. Others have volunteered. First one man will agree, then another, and having obtained one or two the rest have consented, the men not caring to be accused of showing the white feather. It is in this way that the crews of many vessels now abroad have been obtained, and some of the vessels sent abroad will be of very little use patrolling because they have not the necessary speed.

Now it has been announced that after the 110-footers are built no more will be ordered. These boats are not the success they were expected to be. They have fallen down in speed, making only about 16 miles. This is no fault of the engines, but because there are three engines driving three propellers which do not get the grip on the water that two would. Then the boats are very heavy. They are much lower in the water than the designer figured they would be, and it has been generally conceded that all they are good for will be harbor patrols, and not for offshore work.

Naval officers always favored a large boat for submarine chasers. They are now still more strongly convinced that to curb the submarines a fleet of high-speed boats large enough to be able to stay outside in all weathers are the only ones of any service. According to reports Germany now has submarines 300 feet long, that make 22 knots and mount 6-inch guns. Of what use is a slow boat with 3-inch guns against these?

Several plans for fast destroyers varying in length from 150 to 250 feet have been drawn and these plans are now under consideration at Washington. They make from 20 to 25 knots and with standardized methods of fabrication can be turned out very fast.

The Honor Roll

THE Honor Roll is growing fast. Thousands of yachtsmen in all parts of the country have entered some branch of the service for the defense of their country and to aid in successfully pushing the war to a successful termination. In the last issue of THE RUDDER a list of names was published of yacht club members who had enlisted or enrolled. This month the list is much larger, and such big organizations as the Eastern Y. C., the Chicago Y. C., and the Cohasset Y. C., have sent in lists of their members who are entitled to places on the Honor Roll. Other clubs have taken very kindly to THE RUDDER'S idea that the names of their members who are actively serving their country should be published, and the secretaries of those clubs are now procuring the lists, which will be published just as soon as they are received in THE RUDDER office. Notices have been sent to all the yacht clubs and if by any chance one club has been omitted, will the secretary kindly notify the editor and at the same time send in the list of the members of his club who are in some branch of the service, giving his name, his rank and the branch of the service to which he is attached? It is hoped too that the club secretaries will send in supplementary lists, because many more will join either the Army, the Navy, the Medical Corps, or the Aviation Corps in the near future, and many too will be drafted. All are helping the cause and all should be placed on the Honor Roll.

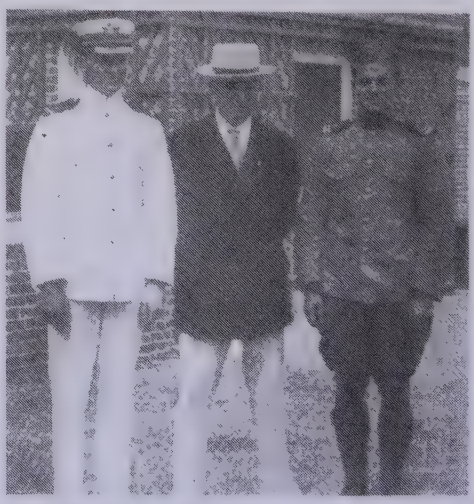
Of course the majority of yachtsmen have entered the Naval Reserve, but many are in the Army, some in the Officers' Training Corps, and others are aiming to become aviators. Then some are in the Medical Corps.

The Eastern Y. C. members have been particularly active. Several members have had patrol boats built which they have turned over to the Navy Department for coast patrol duty, and these boats are manned in many instances by members of the club. The clubhouse at Marblehead has been used by troops, but many of the naval reservists who were in training there have been transferred to Bumkin Island in Boston Harbor. The Spirit of '76 still lives in the New England States and it is very strong in the vicinity of Boston and Marblehead, where the New Englanders made glorious history in the fight for freedom one hundred and forty-one years ago. At the Eastern's clubhouse there are still about one hundred aviators under commanding officer Godfrey L. Cabot, who is also a member of the club.

In Chicago there is also great activity among the yachtsmen. The Chicago Y. C. foresaw that the entry of the United States into the world conflict would create an immediate demand for trained men to serve on Government vessels. They formed the Chicago Yachtsmen's Naval Auxiliary and at once called off all the racing events that had been planned for the season. The work of enrolling yachtsmen began at once and having enrolled many and perfected their organization they sent a report of their work to Captain W. A. Moffett, U. S. N., commandant of the Great Lakes Training Station. The Navy Department gave the movement its official endorsement and the Chicago Yachtsmen's Naval Auxiliary has become the United States Naval Reserve Force Auxiliary, Chicago. The school is on the Municipal Pier, the recruiting office at 120 West Adams Street. Captain W. A. Moffett, U. S. N., is commandant, and Lieutenant A. M. Steckel, U. S. N., is superintendent. The committee is: Chairman, James O. Heyworth; vice-chairmen, James B. Keogh and Charles H. Thorne; treasurer, Augustus S. Peabody; secretary, Ensign George L. Weed, U. S. N. R. F.; Samuel Insull, John T. Pirie, Keene H. Addington, Ensign C. W. Schick, U. S. N. R. F.; George O. Clinch, Lieutenant Thomas J. Prindiville, U. S. N. R. F.; Charles E. Kremer, Charles H. Burras, Lieutenant Thomas L. Stitt, U. S. N. R. F.; Lieutenant A. M. Steckel, U. S. N., Godfrey H. Atkin, D. F. Kelly, Robert Tarrant, Eugene G. Fassett, H. R. Greene, Lieutenant W. T. Cooper, U. S. N. R. F.; Lieutenant W. M. Derby, U. S. N. R. F.; Ensign Milton Wilson, U. S. N. R. F.; William Arnold and Ezra J. Warner.

Subcommittees, squad leaders, instructors have been appointed and everything is working with wonderful success. Technical training is given to all who enroll, in scout patrol, coast defense, submarine chasers, transport service and merchant marine. The total enrollment in the school some time ago was over one thousand.

Captain W. A. Moffett has called into active service the boats, Clarinda, crew of 12; Susanne, crew of 11; Raboco, crew of 9; Hyac, crew of 10; Terrior, crew of 6, and Bab, crew of three. The boats used for training are: Pathfinder, Florence IV, Kathmar, Psyche, Yarrow, J. B., Winnetka, Thelma and Sabot. The Pathfinder has a crew of forty men and the others ten men each.



Major-General Henry P. Davison, American Red Cross, and His Sons, Ensign H. P. Davison and Lieutenant F. Trubee Davison. Lieutenant Davison Was Seriously Injured in an Aeroplane Accident Recently

EASTERN YACHT CLUB

Arthur Adams .....Ensign, National Naval Volunteers (Now attached to U. S. S. Nebraska.)
Roger Amory .....Sergeant, Aviation Section, S. O. R. C.
Reed Pierce Anthony .....Seaman, 1st Class, U. S. N. R. F. (Now on Patrol Boat Shada.)
Burrill Devereux Barker....Private, 1st Motor Corps, M. S. G.
Joseph S. Bigelow, Jr.....(Abroad.) Ambulancier, American Ambulance Field Service, Verdun Section, France. Duration of service, six months. Entered Service 14th October, 1916.
Amos Francis Breed .....Captain, U. S. Inf. (On duty at present at Plattsburg, N. Y. Sept. 16, 1916, went to France as Private in American Field Service Ambulance Corps, served seven months at the front in France.)
W. Starling Burgess.....Captain, U. S. A., O. R. S. C.
Norman W Cabot .....Ensign, Naval Flying Corps
Alfred E Chase .....Seaman, 1st Class, Naval Reserve
Philip Putnam Chase.....Commanding Officer, U. S. Scout Patrol Malay, since April 30th.
Bowdoin B. Crowninshield.....Jan. 6, 1916, went to France with American Volunteer Motor Ambulance Corps, as Ambulance Driver, served in Section Sanataire Americaine No. 7, for six months.
Charles Kimball Cummings.....Ensign, U. S. N. R. F. Executive Officer, Marblehead Training Station.
Charles Pelham Curtis.....Provisional rank of Ensign, March 5, 1917, U. S. N. R. F., Class 4
George B. Dabney .....Captain, 1st Corps, Cadets, 1st Reg. Mass. Eng., N. G.
Harold Ward Dana.....1st Lieutenant, Med. O. R. C., U. S. A. (Called for active duty May 21, 1917, and attached to N. E. Dept. Headquarters.)
Robert Wales Emmons.....2d Lieutenant, N. R., Aide to Commandant, 1st Naval District
Redington Fiske..Captain, Supply Officer, 13th Reg., M. S. G.
Albert Geiger, Jr.....Private, 1st Motor Corps, M. S. G.
Frank Gardner Hall.....Private, Ancient and Honorable Artillery Co., State of Mass.
Samuel Augustus Hopkins.....Lieutenant, Medical Corps (British Hospital). (Three months' service with 1st Harvard Unit located at Dans Camier.)
Henry Howard.....Director of Recruiting Service, U. S. Shipping Board
John Lawrence ....Teacher of Navigation under Shipping Board
Robert A. Leeson.....A Co., 1st Motor Corps, M. S. G.
Charles Webster Littlefield....Pay Director, U. S. N., Rank of Captain. (Ordered March 20, 1917, to Navy Yard.)
Caleb Loring.....Ensign, U. S. N. R. F.
Charles E. Loud .....1st Lieutenant. (Supply Officer Paymaster.) 1st Motor Corps, M. S. G.
Godfrey Lowell Cabot.....Lieutenant, U. S. N. R. F.
John Mitchell .....1st Lieutenant, Aviation Section, S. R. C., U. S. A.
Samuel Jason Mixter.....Major, Medical Reserve Corps
James Duncan Philip.....1st Lieutenant, M. S. G., Co. 107
William Townsend Porter.....Served in France, July 8, 1916 to October, 1916, returned to U. S. to complete experiments, and again left for France on May 6, 1917. Now with French Army, studying shock in trenches; now in trenches at Moronvilliers.
Richard S. Russell.....Lieutenant, U. S. N. R. F., Class 4
Huntington Saville..... .....2d Lieutenant, M. S. G., 135th Co. (Cambridge)
Philip S. Sears.....Major, M. S. G. (Military Sec. State Guard Board, State House, Boston.)
Daniel R. Sortwell.....Ensign, U. S. N. R. F.
Robert E. Stone.....Captain, Q. O. R. C., U. S. A. (Also commissioned a Captain on the staff of the Commanding Officer of the State Guard of Mass. Not yet called into active service.)
Benjamin C. Tower....Private, M. S. G., 1st Motor Corps Bat. (Enlistment for two years.)
Bayard Tuckerman, Jr.....Candidate at Plattsburg—Branch of Service, Cavalry
Cornelius Vanderbilt.....Colonel, 22d N. Y. Eng.
Elbert Wheeler .....Member of Military Emergency Board charged with organization and administration of the State Guard of N. H.; Chairman of State Protection Committee, Committee of Public Safety of N. H.
Herbert H. White.....Lieutenant-Colonel, Hospital 22, Royal Army Med. Corps (in France) English Army. Manager Harvard Surgical Unit

CHICAGO YACHT CLUB

Lieutenant Wm. T. Cooper .....Hydrographic Office, Chicago
Lieutenant Wm. M. Derby.....U. S. S. Hyac, S. P. 216
Lieutenant E. B. Weber.....U. S. S. Dorathea, Atlantic Coast
Lieutenant Thos. J. Prindiville..... { U. S. S. Susanne / S. P. 411, Newport, R. I.
Lieutenant-Commander Ogden T. McClurg.....U. S. S. Essex
Lieutenant L. C. Roberts.....U. S. S. Isle de Luzon
Ensign Paul Springer.....U. S. S. Jaydee
Ensign Ayres Boal.....U. S. S. Essex
Ensign Chas. W. Schick.....U. S. N. R. F. Auxiliary, Chicago
Ensign Geo. L. Weed.....U. S. N. R. F. Auxiliary, Chicago
Ensign Chas. W. Steele.....U. S. S. Dickey
Ensign Milton Wilson.....Great Lakes, Ill.
H. C. Good.....Seaman, Owner U. S. S. Roboco, S. P. 10
Lieutenant Thos. J. Kelly.....Artillery, Ft. Sheridan, Ill.
Dr. W. W. Hoyt .....Washington, D. C.
Wm. B. Ashby.....Officers' Training Camp, Ft. Sheridan, Ill.
R. A. Mead.....Officers' Training Camp, Ft. Sheridan, Ill.
Frank B. Gifford..... { Director General, / Red Cross, Washington, D. C.
James P. Walker.....New York, N. Y.
Chas. H. Thorne.....National Council of Defense

Fred Herendeen	C. B. McDonough
Major T. W. Betak	Lieutenant Edward Gundlach
Horace Powers	Harold D Huszagh
Major Chas. R. Vincent	Morris M. Smith
Lieutenant David Evans	Dr. Daniel Rogers

NEW HAVEN Y. C.

United States Navy

Robert G. Baird .....Ensign, Connecticut Naval Militia
Frank E. Bollmann....Lieut. (J. G.), Connecticut Naval Militia
Charles A. Maynard.....Lieutenant, Connecticut Naval Militia
Clifford M. Peck ..Lieut. Commander, Connecticut Naval Militia

United States Naval Reserve Force

George D. Atwood .Chief Petty Officer, Sec. 1, 3d Naval Reserve
Traver Briscoe .....Petty Officer, Sec. 1, 3d Naval Reserve
Frank S. Cornwell .....Lieutenant, Sec. 1, 3d Naval Reserve
Osborne A. Day....Lieutenant (J. G.), Sec. 1, 3d Naval Reserve
George F. Eaton .....Ensign, Sec. 1, 3d Naval District
Franklin Farrel .....Ensign, 2d Naval District
John K. Murphy..... { Lieut.-Commanding Officer, / Sec. 1, 3d Naval District
John J. Phelps.....Ensign, Sec. 1, 3d Naval District
Raynham Townsend ..... { Lieut. (J. G.) Surgeon, / Sec. 1, 3d Naval District

MANCHESTER YACHT CLUB

Reed P. Anthony.....Seaman, N. R., on Patrol Boat Harvard
Boylston A. Beal.....Secretary to U. S. Legation, London
Francis T. Colby .....Lieutenant, Belgium Army
Admiral H. G. O. Colby, (Retired)..... { Free Lance among / workers in France
Charles K. Cummings..... { Ensign, Naval Reserve, / on U. S. S. Cecilie
William Dexter.....Harvard Reserve Officers' Training Corps
Everett Fabyan.....Ensign, U. S. Navy, Newport
Charles E. Hodges, Jr.....Seaman, Naval Reserve, 1st District
John Amory Jeffries.....1st Lieutenant, Infantry, Plattsburg
Ammi W. Lancashire .....Aid in Dept. of Censorship
John Lee Merrill.....Naval Reserve, Annapolis
Roger Putnam.....Working in Factory on Government Orders
Herbert M. Reece....Flight-Commander, Royal Corps, England

COHASSET YACHT CLUB

Kendall Bates .....Harvard Regiment
Wm. DeFord Bigelow .....Ambulance driver in France
Stephen Bigelow .....Lafayette Escadrille
John Black, Jr. .....Ensign, U. S. N. R. F.
Arthur Blake .....Ensign, U. S. N. R. F.
Robert Fulton Blake .....Submarine Signal
Hugh Cabot .....Doctor, Hospital Unit, France
Richard Cabot .....Doctor, Hospital Unit, France
Geo. W. Cobb, Jr. .....Battery A, 1st Mass. Field Art.
Richard H. Cobb .....Ensign, U. S. N. R. F.
Wm. R. Cole .....Private, 37th Co., M. S. G.
Edmund Collier .....U. S. Army, Field Art.
Geo. W. Collier .....Private, 37th Co., M. S. G.
Morton S. Crehore, Jr. .....Hospital Service, Connecticut
Lewis A. Crossett .....Y. M. C. A., France

Dudley S. Dean .....2d Lieutenant, 37th Co., M. S. G.
James Dean .....Corporal, 37th Co., M. S. G.
Wm. B. Gagnebin .....Private, Troop B, Cavalry, M. N. G.
Dudley C. Goodwin.....Private, Co. K, 6th Reg., M. N. G.
Lester W. Harding .....Asst. Paymaster, U. S. N. R. F.
Chas. Higginson .....Ensign, U. S. N. R. F.
Frederick Higginson, Jr. .....Quartermaster, U. S. N. R. F.
Paul Howe .....Private, 37th Co., M. S. G.
Benjamin James .....1st Lieutenant, Artillery, U. S. R.
Dean K. James (Commodore).....Sergeant, 37th Co., M. S. G.
Howard A. Johnson..... Corporal, 37th Co., M. S. G.
Alfred W. Jones .....Private, 37th Co., M. S. G.
John A. Knowles .....Captain, U. S. R., Infantry
Thomas Lothrop .....Private, Co. K, 6th Reg., M. N. G.
Wm. B. Long .....Private, 37th Co., M. S. G.
Matthew Luce .....Private, 37th Co., M. S. G.
Geo. F. Newton, Jr.....Chief Machinist, U. S. N. R. F.
Jewett B. Newton .....2d Lieutenant, Artillery, U. S. R.
James Newton ..Machinist, 1st Class, U. S. N. R. F., Aviation
Edward Nichols .....Private, 37th Co., M. S. G.
Geo. Osgood .....Doctor, Major, Hospital Service in France
Ronald Osgood .....Private, 37th Co., M. S. G.
Edwin S. Otis .....Private, 37th Co., M. S. G.
Wm. T. Reid, Jr.....Corporal, 37th Co., M. S. G.
Sheldon N. Ripley, (Vice-Com.)..... { 1st Lieutenant, Co. K. 6th Reg., M. N. G.
Joseph Sargent .....Major, U. S. R.
Walter Shuebruk .....Private, 37th Co., M. S. G.
Edward E. H. Souther.....Private, 37th Co., M. S. G.
Ralph Stoddard .....Seaman, U. S. N. R. F.
F. Lucas Sutcliffe .....Corporal, 37th Co., M. S. G.
Burgess C. Tower .....Private, 37th Co., M. S. G.
Gilbert S. Tower, (ex-Com.) { Lieutenant (J. G.) U. S. N. R. F., Construction
Horatio B. Tower ..... Private, 37th Co., M. S. G.
Prescott Townsend .....Machinist, U. S. N. R. F.
Richard S. Townsend .....Aviator, U. S. N. R. F.
Wendell Townsend .....Machinist, 1st Class, U. S. N. R. F.
J. Willard Tuckerman .....Sergeant, 37th Co., M. S. G.
J. C. White, 2d.....Ensign, U. S. N. R. F.
Edward F. Willcutt .....Sergeant, 37th Co., M. S. G.
Joseph N. Willcutt .....Major, U. S. A., Quartermaster's Dept.
Lawrence Williams .....Private, Battery A, M. N. G.
M. S. P. Williams..Boatswain's Mate, 1st Class, U. S. N. R. F.

U. S. N. R. F. — U. S. Naval Reserve Force.
M. N. G. — Mass. National Guard.
M. S. G. — Mass. State Guard.
U. S. R. — U. S. Reserve—Army.

BAY HEAD YACHT CLUB

S. Bonnell	P. Hassinger
R. Bonnell	Wm. J. Littell
Sydney Brewster	W. S. MacLaren, Jr.
T. J. Buckley	W. Morris
R. H. Byrne	P. M. Pope
J. C. Cattus	J. R. Rowland
H. Church	C. P. Smith
O. G. Dale	H. H. Smith
H. C. Dick, Jr.	E. A. Weeks, Jr.
R. D. Franklin	E. Willis
J. L. Hart	

Wm. M. Bristol, Jr.....Ambulance Service in France
H. W. Buxton.....U. S. N. R. F.
C. B. Cattus.....2d Lieutenant, 12th N. Y. Inf.
Henry Schieffelin Clark ..... Major of Ordnance, U. S. A.
H. Dahn .....U. S. N. R. F.
R. A. Dahn .....U. S. N. R. F.
R. R. Foulke .....O. T. C.
F. L. Gould .....National Guard
J. H. Hentz .....U. S. N., Coast Defense
H. K. McCay .....U. S. N. R. F.
D. F. Miller ..... { Quartermaster, 1st Class, Patrol B3, U. S. Coast Patrol
C. Overman .....U. S. N. R. F.
N. Overman .....U. S. N. R. F.
W. Paxton .....U. S. N., Coast Defense Reserve
R. Souder .....U. S. N. R. F
C. Smith ... .Ambulance Service in France
R. C. Wettlaufer .....National Guard
J. R. Whitney .....U. S. Navy

HUGUENOT Y. C.

Hobart W. R. Wheeler .....Machinist's Mate, Naval Reserve
James H. Woodward .....Boatswain's Mate, Naval Reserve
Gustav G. Vigouroux.....Coxswain's Mate, Naval Reserve

CRESCENT ATHLETIC CLUB

Colonel James R. Howlett..... .....14th Reg., N. G. N. Y.
Captain James G. Conroy.....14th Reg., N. G. N. Y.
Dr. H. Sheridan Baketel.....Medical R. C., U. S. A.
Major John C. Ostrup .....15th N. Y. Engineers
Lieutenant George M. Dodwell..Royal Field Artillery, in France
Wallace Thaxter Jones, Jr.....O. T. C., Madison Barracks
Dr. Victor A. Robertson .....Hospital in France
Lieutenant Charles McDougall.....1st N. Y. Cavalry
Harold V. L. Flannery....Non-Commissioned Officers' School
H. H. von Glahn.....U. S. Marine Corps
Dr. J. P. McQuillin .....U. S. A., Medical Corps
Edwin Hicks Bigelow.....O. T. C., Madison Barracks
John A. Simmons.....O. T. C., Plattsburg
Drew McKenna .....Lieutenant 1st Inf. Co., Plattsburg
Samuel Greason, Jr.....Captain. 1st Cav. Troop, Plattsburg
Commodore Robert P. Forshew....Com. Naval Militias, N. Y.
Colonel C. I. de Bevoise.....1st Cavalry, N. Y.
Chas. M. Bull, Jr.....Captain, U. S. A.
Wallace Brown.....Lieutenant, U. S. N. R.

BABYLON YACHT CLUB

United States Naval Reserve

Jonathan Thompson .....Quartermaster
Noel Carpender .....Able Seaman
A. D. C. Arnold .....Able Seaman
Charles Lehman .....Assistant Engineer's Mate

United States Army

J. Gerald Benkard ....S. R. T. C., Peekskill
Robert Guggenhein .....2d Lieutenant, U. S. A.

HINGHAM YACHT CLUB

Wm. Lambert Barnard. Ex-Com. **Hingham Y. C.** { Executive Officer U. S. S. Dupont Now acting Judge Advocate, Charleston Navy Yard
Ralph W. Leigh..... { Quartermaster, U. S. N. R., Bumkin Island Training Camp

Yachts Now in Service

The following yachts are now in the Naval Service. These are in addition to the lists already published in The Rudder.

STEAMERS

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Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Power Dinghy Porgy

Editor of THE RUDDER:

Designs of a 10-foot power tender by R. M. Haddock were published in the April, 1910, issue of THE RUDDER.

Captain Cornelius Irons, of Silverton, N. J., is an old friend of mine, the acquaintance dating back to the time when I was learning to sail in a Barnegat Bay sneakbox, many years ago. The old man lives up to the spirit of Longfellow's poem of "The Village Blacksmith" in all the essentials of his attractive character. It is only "happen-so" that he builds boats under a pine tree instead of shoeing horses under a chestnut tree; but this difference in detail only serves to endear him to the heart of the yachtsman.

It was long ago that I graduated from Barnegat Bay to the wider and deeper waters between New York and Cape Cod, where I had learned the crying need of a truly efficient tender. So it was only natural at last to put the plans of the designer into the hands of the builder, and I bear witness with pleasure to the satisfaction which resulted from this efficient combination.

I used a 2-h.p. two-cycle Waterman engine and had a copper tank made to fit under the after thwart to hold six gallons, which is sufficient fuel for about 24 hours of operation. Under test, over a measured distance of 3.2 miles, and carrying two men of average weight, the dink ran at a speed of just a trifle over 5 m.p.h. in two trials, once against the wind and with a slow tide and again in a calm at slack tide. Consequently she has a fuel supply of approximately 120 miles.

The work and material Captain Irons put into the dink are worth mentioning. Her frames are of natural growth cedar, planking (smooth skin) of Barnegat cedar naturally dried over a period of twenty years and scarcely a knot to be seen. She is all copper fastened, her stem is of black walnut, transom California redwood. Her seams are caulked with beeswax, which was a new idea to me, and she is as tight as a drum. Her beautifully polished bright finish is a delight to the eye. I had her lengthened out so that she measures 10 feet 11 inches on top, which adds to her comfort and carrying capacity.

I have always refused to spoil a good clean windjammer with a gasolene auxiliary. But a power dink I admit is handy and comprises my solution of the dead calm; for the dink will tow or push my 21-footer when all hope of a breeze is gone.



Captain Cornelius Irons, of Silverton, N. J.

The photograph shows Captain Irons, his ways at Kettle Creek, the power dink he built for me, and my good little old Seawanhaka which she serves as tender.

New York. DAVID MOFFATT MYERS.

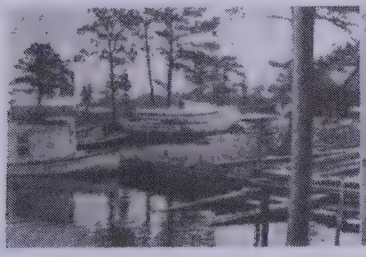
Square-Riggers Off Bay Ridge

Editor of THE RUDDER:

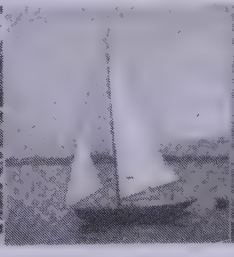
Last evening I retired to the library of the Crescent A. C. at Bay Ridge and read from cover to cover the last issue of THE RUDDER. I found it very interesting.

During the past week there were anchored in upper New York Bay, within plain view of the summer house of the Crescent A. C., two three-masted square-riggers which, by their appearance, recalled the old clipper ship days. Both ships were built in the eighties, full rigged, iron hulled, teakwood trimmed—the finest types of their race. Both had loaded oil at Bayonne and were to sail about the same time for the same port—Buenos Aires.

At sunset time they presented a beautiful picture with their mass of rigging and their yards swung around at various angles.



Captain Irons's Boat Shop at Kettle Creek, Near Barnegat



Seawanhaka, Mr. Myers's 21-Footer



The Power Dink, 10 Ft. 11 In. on Top, Built by Captain Irons

At dusk on Sunday evening, August 5th, this picture was adorned by the arrival of a five-masted square-rigged windjammer, which flew the flag of France, and which apparently had auxiliary power for she slowly forged through the Narrows and anchored.

Naturally the present interest of Crescent Bay Ridge dwellers is on warships, destroyers and transports, but the sailor's eye is pleased by the number of sailing vessels that are still passing to and fro, and especially when he catches sight of square-riggers, reminders of the day when they raced around the Horn and to various ports of the world.

Brooklyn, N. Y. PALMER H. LANGDON.

A Few More Kindly Words

Editor of THE RUDDER:

I wish to take this occasion to congratulate you on the great improvement in your magazine and to say that, in my judgment, I consider it the best publication of the kind and would not be without my magazine for a great deal.

With very best wishes for a prosperous future, believe me,

New York. EPHRAIM WILLIAMS.

* * *

Editor of THE RUDDER:

I have been one of THE RUDDER crew via the Public Library, but it's getting too good; I must have it at home.

California. B. C. PHILLIPS.

* * *

Editor of THE RUDDER:

Enclosed find subscription, can't miss THE RUDDER, she's a hummer.

Thousand Islands. JOHN C. BELDEN.

Chart Table

Editor of THE RUDDER:

In hazy weather why are sights taken from a lower deck more reliable than those taken from a higher one?

New York. T. L. JOHNSON.

The less your height above the sea the less your range of vision, or your horizon is nearer to the ship. If you can see clearly for two miles then a horizon at a distance less than that will be reliable, but if you go to a height that puts your horizon at a distance greater than that it will be hazy, soft and unreliable

* * *

Editor of THE RUDDER:

How do you take out the log function of an angle between 90° and 180°? When the polar distance is greater than 90° I am not sure whether to take the minutes from the bottom or top of the page.

Brooklyn. A. M. BROWN.

Take the name of the function from the same end of the page as the degrees of the angle are printed and the minutes from the opposite end.

Example: Log cosecant 110° 25'
Table 44, Bowditch
Page 792: 110° is at the bottom.
Left-hand side minutes begin at top (opposite end).

Run down to 25' across the column labeled cosecant at bottom and find log 10.02818.

* * *

Editor of THE RUDDER:

What kind of a knot should be used in bending the rotator of a log on to the log line?

Massachusetts. H. H.

A figure-eight knot (apprentice knot) should be used. Haul well taut and tuck in the end.

* * *

Editor of THE RUDDER:

What are the advantages of the Marc St. Hilaire method of working sights over the ordinary methods in use?

Providence. NOVICE.

The St. Hilaire method gives the position line of the vessel by the same mathematical process regardless of the position of the observed body. You use the same formula for a body near the prime vertical as for one near the meridian; also, most of the work of computation can be done before the observation, and by using a table of computed altitudes and hour angles the computation is reduced to a small amount.

* * *

Editor of THE RUDDER:

What is meant by the terms, soft or hard horizon?

Maryland. S. C. GILMAN.

A soft horizon is a hazy, indefinite horizon of such a nature that there is no sharp, definite line of markation.

A hard horizon is one that has a clear, definite line of markation between the sky and sea.

* * *

Editor of THE RUDDER:

What is the best method of obtaining the index correction of my sextant and how often is it necessary to determine it?

New York. M. W. BLISS.

If a good hard horizon is available, bring the true and reflected horizons into coincidence. If the zero on the vernier is to the left of the zero on the arc the correction is negative; if to the right the correction is positive. The correction is numerically equal to the reading on or off the arc. The same process, using the direct and reflected images of a star, will give a more accurate result; but with a good horizon the former method is accurate enough for all practical purposes. At sea we check up our index corrections the first day of each voyage and oftentimes two or three times a week. Wiping off the horizon glass will sometimes throw it out of adjustment.

* * *

Editor of THE RUDDER:

While taking sights with a class I invariably get two or three minutes greater altitude than the others, and anyone using my sextant gets the same results. It has no index correction as far as I can determine.

Connecticut. J. C. ATWOOD.

Your instrument probably has an eccentricity error which gives correct altitudes when they are low but is in error for high altitudes. This is due to the center pin being bent or having worn on one side. Take it to a

good nautical instrument dealer and have him correct, if possible, or else determine the error for the different altitudes.

* * *

Editor of THE RUDDER:

When several officers pass in their noon positions and they vary by several miles, as I understand they sometimes do, which position is used officially?

New York. NAVAL RESERVE.

The commander of the ship decides that, and if they are within four or five miles he would generally take the mean of them. If some positions are from stars taken at dawn, and some from the sun taken at different times during the morning, the atmospheric conditions at times of sights, the hour angles of the observed bodies, the dead reckonings from sights to noon, and the reliability of the different observers are all taken into consideration. Oftentimes one officer, though several miles ahead or astern of all the others, will have taken his sights under more favorable conditions and would be more apt to be nearer right than the others. In making landfall always err towards the land, as you should make the land ahead of your ship.

* * *

Editor of THE RUDDER:

In taking courses from a chart of Long Island Sound I differ in some cases by several degrees from those published in the Course Book of Long Island Sound issued by THE RUDDER. Though I have been very careful, I suppose that THE RUDDER book is correct and that I must be in error somewhere.

Long Island. B. F. SPEARS.

What variation is the rose compass on your chart? If you correct your variation to this year and also that in the Course Book (Variation, 1906), annual change, increase 6 minutes, this will possibly account for some of the error. The rest of the difference is probably due to differences in distance off point of departure and destination. Also the courses in THE RUDDER book are given to the nearest quarter point and not degrees.

* * *

Following are a few test questions given to watch officers and met by them in practice, which require quick decision. Try to answer instantly and then think them out.

If you were running before the wind and saw the red and green lights of a vessel ahead, what would you do?

Suppose you were running in a fog and heard two long blasts of a steamer's whistle, what would you do? (Steamer not visible; thick fog.)

Suppose you heard one long and one short blast of a steamer's whistle and right afterwards saw a red light on your starboard bow, what would you do? (Thick fog.)

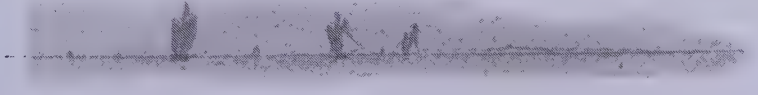
Suppose you met a patrol boat flying the code flag H, what would you do?

Yachts Building for 1917

PART IV

POWER

Name of Yacht	Owner	L. O. A. Ft.	In.	B. Ft.	In.	D Ft.	In.	Designer	Builder	Engine, Maker	No.	H.P.
Admiral III	Henry Kleine	35	0	6	6	2	0	Hunter	Everett Hunter Boat Co.	Loew-Victor	(1)	....
.....	W. Flattish	35	0	9	6	2	4	Banfield B. & L. Wks.	Banfield B. & L. Wks.	Gray	(1)	24
Happy Daze	W. Wagner	34	6	9	0	3	6	Banfield B. & L. Wks.	Banfield B. & L. Wks.	Bridgeport	(1)	22
.....	J. F. Sawyer	33	4	6	4	0	0	W. H. Hand, Jr.	Richardson B. Co.	Sterling	(1)	....
Myrmaide	P. B. Miles	32	8	8	0	3	2	Banfield B. & L. Wks.	Banfield B. & L. Wks.	Standard	(1)	17
.....	J. J. King	32	0	8	0	2	4	H. J. Defoe	Defoe B. & M. Wks.	.....	..	....
.....	E. E. Hutchinson	32	0	6	3	2	6	F. D. Lawley	Geo. Lawley & Son Cor.	Van Blerck	( )	130
.....	.....	32	0	9	0	2	9	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	40
.....	R. C. Peabody	32	0	6	0	2	6	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	66
.....	.....	32	0	6	0	2	6	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	66
Margerite II	Otto Sohns	31	4	6	3	1	10	Hunter	Everett Hunter Boat Co.	Loew-Victor	(1)	....
Hawaii	Col. E. H. R. Green	30	0	6	9	2	3	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	45
.....	S. A. Swenson	30	0	6	0	2	6	Gas Engine & Power Co.	Gas Engine & Power Co.	Speedway	(1)	45
.....	J. B. Rice, Jr.	30	0	8	4	2	8	W. H. Hand, Jr.	Richardson B. Co.	.....	..	....
.....	Eugene Slater	30	0	9	2	2	6	H. J. Defoe	Defoe B. & M. Wks.	.....	..	....
.....	T. B. Vale	30	0	8	0	2	4	H. J. Defoe	Defoe B. & M. Wks.	.....	..	....
.....	F. Sampietro	30	0	9	0	2	0	A. S. Haff	A. S. Haff	Peerless	(1)	20
.....	U. S. Govt.	30	0	6	0	0	0	F. Reppley	Reppley Steel B. Co.	.....	..	....
.....	Huddleston Marsh Co.	30	0	7	0	0	0	F. Reppley	Reppley Steel B. Co.	Sterling	(1)	25
Kingfisher	R. Fisher	30	0	8	6	1	6	Banfield B. & L. Wks.	Banfield B. & L. Wks.	Bridgeport	(1)	16
Jane	Louis Kuenle	30	0	6	0	2	4	A. E. Apel	Ventnor B. Wks.	Sterling	(1)	35
.....	F. A. Nathan	30	0	7	0	3	4	A. E. Apel	Ventnor B. Wks.	Peerless	(1)	35
Vivian I	Jesse Baker	30	0	6	6	1	6	Hunter	Everett Hunter Boat Co.	Hunter	..	....
.....	H. D. Keely	30	0	5	4	1	0	M. Whitaker	John Hafer	Red Wing	(1)	36



THE RUDDER

[Title Registered U. S. Pat. Office]

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

External and Internal-Combustion Engines

Just at this time, when steam has disappeared from all but the largest yachts, when the gasolene engine has attained a stage of perfection which would have been deemed impossible but a few years ago, and when the Diesel engine promises still greater results in point of power and economy, there is a bold ring to the following challenge:

WANTED—A STEAM MOTOR

To the Editor of The Tribune.

Sir: There is a crying need for a steam motor for small motor boats built on some such principle as is employed in steam motor cars so successfully. Steam is a positive power. Gasolene is erratic and unreliable, especially in motor boat engines. I have been trying for years to find a gasolene engine I could run and depend upon. I am convinced that no such engine is built, or ever will be.

I am ready to place an order as soon as a steam motor is on the market. And there are thousands of others like me. Who will invent and build such a motor and thereby make a fortune? M. T. RICHARDSON.

Ashland, N. H., Aug. 6, 1917.

If Mr. Richardson were a novice with experience limited to some of the smaller and older two-cycle engines, his sweeping indictment of the internal-combustion engine might be passed without notice, but we understand that he is a practical engineer of long experience, and responsible for a statement made over his signature.

Not only the many successful builders of gasolene engines, but the thousands of satisfied owners as well, will welcome a further explanation of his troubles. While Mr. Richardson refers directly to the smaller launches, the real issue is much broader; between what may properly be called the external-combustion engine, as represented by an engine operated on power generated by the application of fire to a separate boiler, and the internal-combustion type which today is represented by some form of gas engine, and by the hot-bulb and Diesel types using the heavier oils.

The external-combustion engine has attained a very respectful degree of antiquity, even the younger branch of the family, the marine type, being well advanced in its second century. With coal as its ally it has been the subject of a wonderful development, the climax being reached in the combination of sectional boiler and quadruple-expansion and turbine engines. It is beyond the scope of the present article to consider the relations of the external and internal-combustion types in commercial work today, but so far as yachts are concerned the coal-burning boiler has passed away and even the oil-burning type is deemed suitable only for the largest craft. Throughout the half century in which steam was supreme in yachting the development of the ideal cruiser was retarded by the power, the greater part of the hull space, and in the most desirable location, being given up to boilers, bunkers and engines, heavy, bulky and dirty; bad enough in the under-powered auxiliary and very much worse as the speed increased in the full-powered cruiser.

As the size of the yacht decreased the disadvantages of steam increased. Many of us remember the early steam launches of small size with coal as fuel and their successors burning kerosene and gasolene under a coil boiler. Even the earlier and most primitive of the gasolene engines demonstrated their superiority and soon drove out the old kerosene and naphtha engines. In the early days of the automobile steam was the dominant power; the steam Locomobile was extensively exploited in this country; in France the very elaborate and ingenious Serpollet boiler and engine held abreast for some time of the Panhard, Daimler and other gasolene types; and the flash boiler has been brought to a high degree of perfection in the White and other makes of American cars.

The internal-combustion engine has a history of barely a quarter of a century in marine work, the greater part of this time being given to experimental work with gasolene as a fuel. The building of the 60-foot launch Standard with a six-cylinder engine, 8 by 10 inches, of 110 h.p., in 1903, may be taken as the starting point of a new line of experiment in higher engine speed and greater powers that has not yet reached its final limit. The positive progress that has been made in this time is little less than marvelous. The most sensational feature is the development of engines of 3 h.p. to 400 h.p.; but this is less important than the all-around improvement of the four-cycle type, the development of the slow-speed, the medium-speed, the high-speed and the extreme racing engines, and the great range of sizes. Starting with the smallest two-cycle engines, any desired power from 1 h.p. to 400 h.p. may be had in close gradations of increase; and in either the slow-speed, medium or high-speed

Even the most enthusiastic advocate of the marine gas engine will hardly claim that finality has been attained. At times the development has been too rapid, in answer to the demands of owners for higher powers; but in the main progress has been on a sound and substantial basis, and as it stands today the gasolene engine can make a good showing in the four essentials of reliability, flexibility, economy and efficiency in the propulsion of all sizes and types of yachts short of the larger seagoing cruisers. Leaving the gasolene engine, before we come to the recognized domain of steam, there is the heavy-oil engine, hot-bulb or Diesel, to be reckoned with. Thus far comparatively little has been done in the utilization of these types in yachts, but the great progress of the past few years in the propulsion of commercial vessels has demonstrated the advantages of the heavy-oil engine; the present

demands for many cargo vessels of moderate size must prove a great stimulus in the improvement of the type, and it is only a question of time before it is perfected in such sizes as will be suited to yachting service. Not only the advances of the past dozen years but the state of the internal-combustion engine at the present time give every assurance of further improvement in the near future.

The future of the marine steam engine is obviously dependent upon the further improvement of the light sectional boiler using liquid fuel. In comparatively large vessels steam must contend with the internal-combustion engine using the heavy oils and perhaps producer-gas, and also with the new system of electric propulsion. There are possibilities as yet far from realization that may bring back steam in the medium size of yachts if not in small launches, the further perfection of the flash boiler and the production of a reversing turbine with complete speed control, but the outlook at the present time is entirely in favor of the numerous types of internal-combustion engine.

Peace and the Yacht Fleet

The sacrifice of yachts to war uses still goes on and the end is not in sight. One of the latest victims is the schooner Katoura, of 162 feet length, built by the Herreshoffs in 1914 for Mr. Robert E. Tod; the report is that she will be taken for patrol service, though a sailing yacht with auxiliary power. Incidentally, Mr. Tod's former schooner Karina, of 198 feet length, now owned by the estate of the late T. P. Burgess, is offered for sale and it is proposed to convert her into a cargo vessel; though with a draught of 17 feet and 160 tons of lead it is not clear how this can be economically possible. Among the smaller yachts recently junked for their lead are Paladin, the fine 68-foot ketch designed by Cary Smith and built in 1899 for Mr. Walter C. Hubbard, still a staunch and serviceable vessel; and the sloops Pelican and Puck, so long owned by Mr. E. D. Morgan. Pelican, built in 1890, is an interesting vessel, the understanding being that she was the initial experiment of Mr. Herreshoff in a new type, leading to the production of Gloriana in the following year. Puck is one of the survivors of the 30-foot one-design class of fin-keel racing sloops turned out by the Herreshoffs in 1896, perhaps the most successful of all monotype classes. The loaning, leasing and selling of yachts and their conversion to naval uses continues throughout the power division of the fleet.

While the entry of America into the great war is the controlling factor in this disintegration of the yacht fleet, there have been other causes at work for several years back. Many of the larger steam yachts and also of the modern auxiliary schooners have been sold not through the demands of foreign nations for naval auxiliaries or to fill gaps in foreign commercial and fishing fleets, but because their owners were tired of them and there was no demand on the part of other yachtsmen. Important as they are, the reasons for this state of affairs are not plainly apparent.

With peace still hovering elusively below the horizon, it would seem that American designers, though busy for the time with war or commercial work, are looking forward to an active demand for yachts in the near future and are preparing to meet it. The report is current that many designs are in preparation not on definite order but to meet an anticipated demand, and while the majority will be for power cruisers, some at least of the designers look for a revival of the auxiliary schooner, ketch and yawl. Pending the eagerly awaited advent of the dove of peace, there is a swallow that does not make a Summer in the report that a positive order for an auxiliary schooner of about 200 feet has been placed with the Herreshoff Company by Mr. W. Harry Brown, for whom the Visitor II, now Guinevere, of about that size, was designed by A. L. Swasey and built by Lawley in 1908. Even if true, this means but little; there are always a few, but only a very few yachtsmen who care for such a craft; and its report by no means betokens the revival of the sailing yacht with auxiliary power.

Just what form the revival shall take when it does materialize rests very largely with the designers. While the owner naturally studies the problem from an individual standpoint, the designer should take a broader and deeper view, embracing the development of yachting as a whole; he possesses that technical knowledge which most owners lack of both naval architecture and marine engineering, and in the latter field particularly his knowledge of what the market offers in the line of marine engines and of the probable developments of the near future should guide him in advising clients as to new types of yachts.

It is to be hoped that every man who aspires to design yachts today is fully informed as to the history of yachting both in its general and technical aspects, that he is prepared to profit by both the mistakes and the successes of the past in his work for the future, and that his knowledge has a far broader basis than the mere study of the principles of naval architecture in a college. Coming in a time of transition, when power is rapidly displacing sail and when steam itself is largely disappearing as the medium of power, the war has practically wiped out the national yacht fleet, and its close will find every designer with a clean sheet of paper before him on which he may create anew at will.

Bids for Navy Launches

The contracts for building hulls of launches and whaleboats for the U. S. Navy have been awarded to the South Jersey Yacht Building Company, of Atlantic City. This company furnished the lowest bids for all the sizes. A full list of the bids was published in the Quarter-Deck Department of last month's RUDDER. They showed a wide divergence between the high and low. The price bid for the 24-foot whaleboat was $395 each. Some years ago when materials were cheaper and labor not as costly as now, the Navy Department published a book of the standardized designs for boats of the Department. This book contained, in addition to the plans, the specifications, and cost. It was then figured that the material for a 24-foot whaleboat would cost $203 and the labor $811, making the total $1,014. It has been figured by one who knows that the metal work on each boat will now cost $110. It will take a pattern-maker two weeks to cut the patterns, and with material and labor as high as it is now $1,000 a boat would be a conservative bid. The Navy officials know what these boats cost and they know, too, how difficult it is now to obtain materials and labor, and by accepting such bids, far below estimated cost, they are practically putting the small boatbuilder out of business.

Alberta is the subject of the supplement of this month's RUDDER. Until recently this yacht was the property of former Commodore Frederick G. Bourne, of New York Y. C., but has been sold to the Russian Government and is, like many other yachts, to be used as a hospital ship. Originally this yacht was named Margarita, and she was built in 1896 from designs by the late George L. Watson for Anthony J. Drexel. She was sold to the late King of the Belgians and shortly after his death was purchased by Commodore Bourne. Alberta, the name given when the yacht flew the Belgian flag, was built by the Ailsa Ship Building Company at Troon, Scotland. She is a steel vessel, 278 feet over all, 238 feet 8 inches on the water-line, 33 feet 8 inches breadth, 18 feet 5 inches depth and 15 feet 4 inches draught. Her gross tonnage is 1,322 and she is driven by twin screws turned by two quadruple expansion engines with cylinders 14, 22, 31 and 44 inches, respectively, in diameter, by 27 inches stroke.

* * *

Many of our friends were disappointed because they were unable to obtain the August issue of THE RUDDER. The demand for that number outlasted the supply and we were just as sorry as those who failed to obtain copies. THE RUDDER management tries to keep pace with the growing demand and increased circulation. It is forced to observe rules of economy because of the high price of paper and materials generally, and to flood the newsstands with copies that are returnable if not sold, is a ruinous waste. There are two ways of being sure of obtaining a copy regularly each month—send a subscription, $2, to THE RUDDER and receive it each month through the mails, or, place an order with your newsdealer and let him deliver it to you. When either of these methods is followed we know very nearly what the demand will be and can provide accordingly. THE RUDDER's circulation is growing so fast and it is making so many new friends each month that the circulation department is hard pressed to keep ahead.

* * *

Without any fear of contradiction we say that in proportion to the size of its staff THE RUDDER has a larger percentage of its members in the service of the country than any other publication. Consequently we do not hesitate to ask our readers for some consideration, and if we disappoint at times they will feel that it is because of the war and of circumstances over which we have no control. Last month a series of articles on Navigation was started. These articles are to be written by Captain Clarence W. de Linden. Captain de Linden had to take his vessel across the ocean at short notice and before he had completed the second article of the series. We sincerely hope that he may avoid all the perils of the sea, and he assures us that he will soon have in our hands more articles to continue the series. Mr. Charles Desmond, who has been furnishing a series of articles on "Designing of Marine Gas Engines," is superintending the make-over of many of the seized German vessels and has had no time for other work. This series will be continued next month.

* * *

The cover this month is a scene from the lawn at Henry P. Davison's estate at Glen Cove. The 38-footers racing in the distance have proved more attractive than the tennis and the younger crowd are seen gazing at the yachts in the distance. The scene is an odd one and its beauty lies in the fact that no one posed for the camera.

Spokes from the Rudder Wheel

The year book of the New York Y. C. has been issued. Secretary George A. Cormack has shown his usual care in the compilation of the statistics of the club. There are six hundred and six yachts enrolled in the club. The membership list numbers nearly 2,300 and there are eight women associate members. Irving Grinnell, who was elected May, 1856, is No. 1; Charles H. Stebbins, elected August, 1857, is No. 2, and James Gordon Bennett, elected August, 1857, is No. 3.

* * *

The year book of the Larchmont Y. C. shows that there are three charter members of the club still members. These are A. Bryan Alley, Frank L. Anthony and Eugene L. Busche. There are five hundred and thirty-four active members in the club, in addition to the charter, junior and flag members, and the fleet of yachts numbers one hundred and ninty-five.

* * *

The year book of the Seawanhaka-Corinthian Y. C. shows that the club has a membership of three hundred and forty-four. Four of the founders of the club, William Foulke, Bayard F. Foulke, Frederick de P. Foster and Gerard Beekman, are still on the list. The book contains in addition to rules, by-laws, etc., a record of last year's racing and the point scores in all the series races.

George R. Duryea, of Greenwich, Conn., has chartered the Class R sloop Huskie and will race against the new Rogue off Marblehead. Timandra (formerly Banshee) and Rogue will represent the Great Lakes and sail against Huskie. Jack Tar and Ilderim will meet the visitors.

* * *

Commodore George F. Baker, Jr., of New York Y. C., who is now in Italy in the interests of the Red Cross, has been commissioned Lieutenant-Colonel. The Red Cross has been organized on a military basis. The Major-Generals are William Howard Taft and Henry P. Davison.

* * *

Ensign II, built by Lawley for L. L. Driggs, is launched and her trials have shown that she will be fast, seaworthy and comfortable. She is 85 feet long, 14 feet 3 inches breadth, 3 feet 9 inches draught, and is driven by two 6¾ by 8¾-inch Driggs engines. The work of these engines is being watched with much interest.

* * *

Joseph Bister, secretary of the Orienta Y. C., has resigned and Herbert R. Houghton has been appointed to fill his place. Mr. Bister recently married Miss May Howes, of Bridgeport. He is now living in New York City and consequently cannot attend to the secretarial duties so far from the club. His club friends hope that his absence will be only temporary.

OCT 5 1917
UNIV.

THE RUDDER



October, 1917
Vol. XXXIII No. 10

Navigation
For Beginners

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On Atlantic and Pacific Coasts

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Where Uncle Sam's Sailors are Trained

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49 North and
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SPEEDWAY Express Cruiser.

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An interesting development of the Fifty-Two foot Cruiser is the twin-screw 8-cylinder, 60-foot model, which has a speed slightly in excess of 25 miles.

Deliveries of the Fifty-Two foot boats can be made in ten weeks. The larger models require a few weeks more for completion. A few will be ready for Southern cruising. Prices subject to quotation.

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Supplement to The Rudder

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Length 160 Ft. Breadth 18 Ft. 6 In. Draught 9 Ft. Built 1900, by Varrow & Company. Designed by Cox & Eling. Driven by Three Turbine Engines.

A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII | October, 1917 | No. 10

Where Our Young Bluejackets Will Be Trained

By Walter Scott Meriwether

SINCE the declaration of war with Germany 133,000 recruits have been enlisted in the Navy. During the same period 13,000 new men have been added to the Marine Corps. All of those enlisting under the Union Jack and those joining the colors of the marines, were volunteers and the vast majority of them were wholly untrained.

As it requires a much longer period to make an efficient man-of-war's man or an efficient marine than it does to turn out a soldier, as no ships were available for training purposes and as time was a matter of essence, the Navy was confronted with the big problem of how to train men for shipboard life elsewhere than on ships, of how to predigest, as it were, this vast quantity of new blood.

In its usual efficient way the Navy went at the job and so quietly has it worked that the public has heard little or nothing of an undertaking which has strung the nation's seaboards with training camps. More than twenty of these cantonments are now either completed or verging on completion. The stations provide accommodations for an aggregate of 80,000 embryo bluejackets, while in Virginia and South Carolina are other stations which are to house 25,000 marines.

These training stations are not a mere jumble of huts pitched haphazard in any old place. They are model cities, built of wood and built on sites which had been selected with utmost care, medical experts being asked to decide on the healthfulness of the locations while transportation experts were brought in to determine



Clearing Away Site For the Naval Training Camp at Puget Sound, June 1st, and the Same Site on July 6th, When Camp Was Nearly Ready For Recruits



The Newport Training Station Has Been Enlarged by Barracks to Accommodate 9,000 Additional Recruits

transportation facilities. Hundreds of sites were examined before selections were made.

Upon these sites little cities have sprung up with a speed far outrivaling that of any of the old boom towns of the golden West. Scientifically laid out, with provisions for roadways and walks, they also have water and sewer connections, central power plants which give electric light for streets and interiors, have storehouses for supplies of every description, including cold storage, ice plants, bakeries, cook houses, mess halls, shower baths, filtration plants, garages and garbage incinerators. At each cantonment there is also a large Y. M. C. A. pavilion, —not government built, but playing an important and officially recognized part.

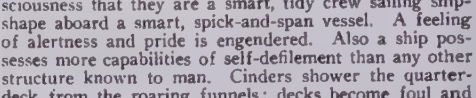
In the center of each cantonment has been emplaced a parade ground of fifty acres, a space which will be used for drill purposes and as a general recreation ground, where baseball and football will be played. The Navy is very strong on athletics, for it realizes that it is through these fiercely contested games that brawn, muscle and initiative are best developed.

In each cantonment is a complete establishment for the reception of new recruits and where each batch of new arrivals must spend three weeks, during which time they are under the constant observation of medical officers. No infectious disease is to appear in these cantonments, if vigilance can prevent it. But the period of detention is not a period of idleness. During their stay in quarantine the recruits are taught how to care for themselves and the $60 outfit which the Government furnishes free. Particularly are they taught personal cleanliness, not cleanliness as the average civilian knows it, but the supercleanliness of the Navy.

I have heard landsmen deprecate the stress laid by naval officers on cleanliness of ships and men. "Why should sailors wear white clothes," they ask, "and why, moreover, should they be continually busy scrubbing them and mopping decks? Why should officers give them such drudgery to do?"

This is the curiosity of ignorance. A sailor's first duty is to keep himself and his quarters clean, and he wears white so that his officer may know at a glance whether or not he is clean. Primarily nothing contributes to the esprit de corps of personnel so much as the consciousness that they are a smart, tidy crew sailing shipshape aboard a smart, spick-and-span vessel. A feeling of alertness and pride is engendered. Also a ship possesses more capabilities of self-defilement than any other structure known to man. Cinders shower the quarterdeck from the roaring funnels; decks become foul and sticky after every mess-call; tar, paint, oil, graphite continually misplace themselves and call for removal to less mischievous localities. Neglected bedding would breed disease; unscrubbed decks would in two days reduce vessel and crew to the level of tramps. Therefore, it is constantly and persistently impressed upon the recruit that he must take pride in his endless combat with dirt as a preparation for the supreme test, battle—when the mere detail of an unclean deck or garment may be his death warrant through an infected wound. Cleanliness aboard ships is simply an extension of the modern aseptic operating-room idea.

Nor can any conversational filth be brought into these training camps, for, despite a widespread misconception, the Navy is clean of mouth as its clean-lipped guns.



Camp For Naval Reserve Force at Newport

Each cantonment has a hospital unit, containing a thoroughly equipped dispensary, also anesthetizing and operating rooms and offices for the medical staff. The wards are as clean, cheerful and comfortable as wards can be made, many of them being fitted with sun parlors.

The purpose of the Government in authorizing the construction of these cantonments and hurrying them to completion in record time, is to produce in the lowest practical minimum of time a trained body of seamen capable of handling and fighting a ship. For this reason the deliberate vocational, educational method of training used in times of peace is superseded by an intensive system of drill and instruction calculated to fit recruits for taking up sea-duty according to their several aptitudes in much less than the time formerly occupied. The actual period varies with conditions, though four to five months in training camp is considered desirable. Commissioned and petty officers of the regular service constitute the instructors, and excellent results are being attained.

Several of the new training camps are already in full commission and in these the recruits are busy learning the rudiments of Navy work, being practiced in artillery and infantry drills, in target practice with rifle and revolver; in elementary seamanship, wherein they are taught knotting, splicing, bends and hitches; the handling of boats under oars and sails; signaling with the wigwag and semaphore. The recruits are also sent on hikes and every now and then there is a sham battle, smoke-



Side View of Barrack Building. Eleven Thousand Are Now Under Training at Newport

blown days in which many blank cartridges are expended and when "First aids" bind up the wounded and stretcher bearers lug them off the field.

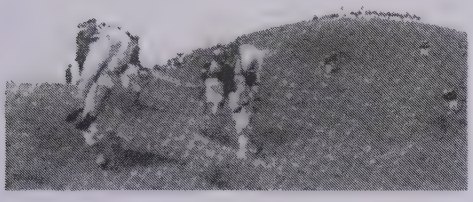
These drills are held daily excepting Saturdays, Sundays and holidays. This is the routine of one of the recently opened stations:

The bugler sounds reveille at 5:00 a. m., when all must turn out and be ready for muster at 5:30. From 5:30 to 7:00 a. m. the recruit is engaged in cleaning himself, his clothes and the camp. Breakfast hour is over at 8:00 and from that time until 3:15 in the afternoon the time is divided into periods for drills, studies and instruction. Extra periods of drill are held after 3:15 for boys who cannot swim and for those who either are deficient or are required to perform extra duty. Otherwise, the time until 6:00 p. m. is devoted to athletics and amusements. Dinner is served at 12:00 and supper at 6:00. Between 7:00 and 8:00 p. m. there is a school for those who are delinquent in their studies, and once a week singing school is held. All are required to be in their hammocks at 9:00 p. m., except when there is a smoker or special entertainment at the station, or the men are on leave overnight.

On Saturday and Sunday the routine is varied as follows: Saturday, Assembly at 9:00 a. m., followed by Captain's inspection. Bag inspection 10:30 to 11:30. From 1:00 p. m. liberty is granted, liberty parties leaving every hour.



Interior of Barracks, Showing Hammocks Swung and Canvas Bags For the Men's Clothing



Recruits in Sham Battle. Carrying Away the Wounded

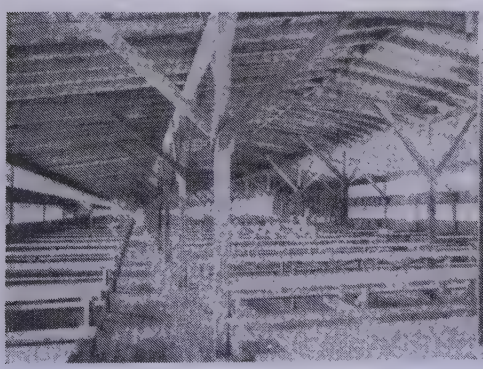
Sunday, call for Catholic Church at 9:45 a. m., call for Protestant Church party at 10:15. From 1 p. m. liberty is granted.

Recruits who show special aptitude for signaling or for wireless telegraphy, are assigned to classes for advanced instruction in either of these branches. Apprentice seamen who show sufficient expertness as radio operators and can qualify in their test are sent to the electrical school at New York for a more complete course of instruction in radio before being assigned to general duty.

The Commandant of one of the training stations pays this tribute to the recruits who have been sent to his station:

"They are good, strong, clean, vigorous young men—volunteers of the highest type—not slackers or shirkers. They are in it to learn and to serve their country—anxious to do credit to themselves and the service.

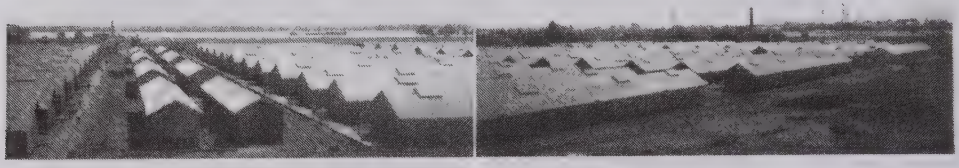
"They are adaptable and amenable to discipline, and of mature enough age to be highly effective. In my estimation the Navy has never had finer material. Their spirit is right—no sulking nor faultfinding. With the preparations we have made and are making for their training I prophesy that the next few months will see an addition to our fighting forces, who, if given the opportunity, will make history worthy of our best naval traditions."



Interior of Recruit Camp at Charleston, S. C., Showing Type of Mess Hall



Section of Camp to House 4,000 Navy Recruits in the Pine Woods of South Carolina



Two Views of the Training Station For Naval Recruits Under Construction at League Island, Pa., Showing the Result of Forty-seven Days' Work

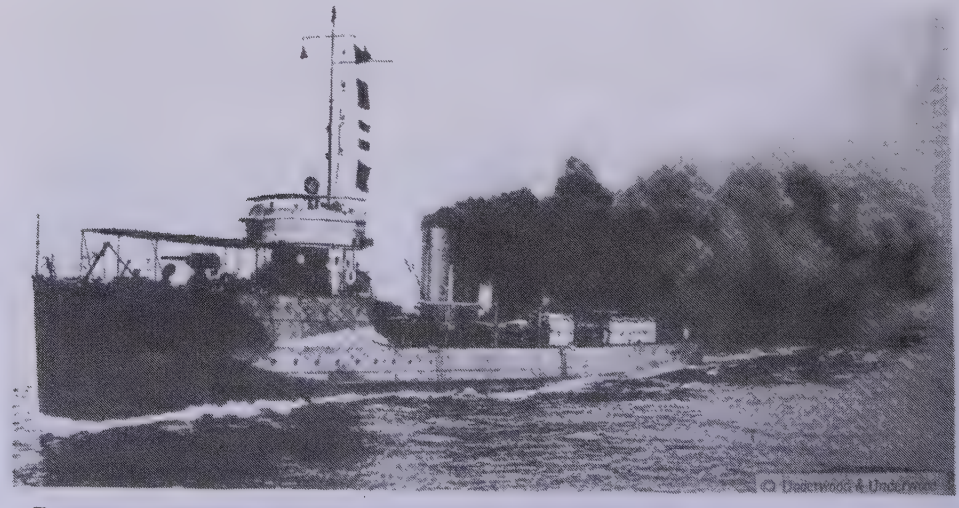
While the recruits get a good rudimentary knowledge of Navy work at these training stations, their real training must begin after they have joined the fleet for, of course, it is impossible to turn out a well-equipped seaman from a training station on dry land.

Writing in the *Naval Institute* (but before this hurried building of cantonments) Lieutenant Ernest Durr argued that—

"Men should be trained afloat, and the minor expense involved is not worthy of consideration if the Navy is to get quick and adequate return from them. Under existing conditions, recruits are sent on board ships much better qualified to be soldiers than sailors. If they were required to spend one-half of the training period in barracks and the other half on board training ships, they could join the fleet and not lack, as they do now, many of the most elemental sailorly qualities. Preparation in advance would fit them to drop into place at once. There need be no lack of discipline nor desirable military qualities, provided such training vessels were based at training stations, and organized and administered with a view to train recruits under the same discipline that now obtains. Ships in reserve could be used for this purpose. The expense would not be prohibitively large, and the ships could be kept in as good, if not better, condition than they are at present.

"After a recruit has been rated ordinary seaman or coal-passer and transferred to the fleet, it must fairly make one ache with disgust to hear him speak of the floors of the ship, of the front and rear ends, of going upstairs and downstairs, and the like. Such ignorance may be inexcusable, but nevertheless it frequently exists. The men are not to blame. They cannot learn to speak the language of the sea in barracks, because, to the average recruit who was raised on a farm or in an inland village or city, seafaring terms are as unintelligible as Greek."

The cantonments were built under the supervision of Rear-Admiral Frederick R. Harris, Chief of Bureau of Yards and Docks, a distinguished officer who established an engineering record when over a bed of shifting sand he constructed the huge dry dock of the New York Navy Yard into which our great dreadnoughts now go when they are in need of repairs.



Warrington, U. S. Destroyer. Speed 30.12 K. One of the Fleet Now Patrolling and of the Type That Safely Escorted General Pershing and the United States Soldiers Safely Into Foreign Ports

Miss Detroit II Makes New Records

MISS DETROIT II won the Gold Challenge Cup of the American Power Boat Association at Minneapolis on August 25th and the following days, and that famous trophy once more goes back to Detroit, where the races will be held next year.

In winning, Miss Detroit II established new records for single laps, for the full course and for the mile speed trials. It is rather singular, too, that she made a new record each day. The old record for the 30 nautical miles was made by Baby Speed Demon on Lake George in 1914. This was 50.49 miles an hour. In the first race at Minneapolis Miss Detroit II covered the course at the rate of 50.7 miles an hour; in the second race she went at the rate of 56.3 miles an hour, and in the third at the rate of 56.5 miles an hour. The fastest lap was in the second race, when she went the six miles at the rate of 59.5 miles an hour, very close to the mile-a-minute mark. In the speed trials Miss Detroit II averaged 61.723 miles an hour in the six runs up and down the course. Last year Miss Minneapolis averaged 61.083 miles an hour.

The steady, consistent running of Miss Detroit II, the high speed she made and the usual accidents that always mar high-speed boat racing, were the chief attractions at Minneapolis. From the racing point of view the series was not a brilliant success. There were four boats on hand to compete for the cup. One, the Whip-po'-Will, owned by Commodore H. L. Judson, was put out of the races before the first one was called. Miss Minneapolis, the defender of the cup, had trouble with her new engines and these had to be removed and the Sterling engines of last year put in the boat, and Hawk-eye II, Commodore Judson's second string, finished only one race without trouble. The success of Miss Detroit II must be attributed largely to the great care taken by Gar Wood, her owner, and by her builder and mechanicians in keeping the boat and engine in the best possible condition. After each race, as is always the case with Smith boats, every part of the engine was carefully gone over, every bolt tightened, and the hull was groomed so carefully that it was always in the finest possible condition for racing.

Miss Detroit is the latest of the Smith boats. She was built last Spring for Garfield A. Wood, of the Detroit Y. C., and is almost a duplicate of Miss Minneapolis, last year's cup winner, except for certain refinements of model. She is driven by the eight-cylinder Sterling engine that was used in the first Miss Detroit, winner two years ago. A new oiling system has been installed, the timing is changed, lynite pistons have been fitted, and other improvements have been made so that the engine is really a marvel. The hull is 20½ feet over all by 6 feet breadth with a single step. The sides are of Philippine mahogany ½-inch thick. The frames are of elm. The bottom is of butternut and the engine bed of white pine. The propeller is a Hyde, 20 by 40 inches. The drive is forward through a gear box to the main shaft, which turns at one and a quarter times the speed of the engine.

Miss Minneapolis was equipped with a new Wisconsin twelve-cylinder aeroplane engine rating at about 450 h.p. It was several hundred pounds lighter than the old engine and in trials worked well. The day before the first race, however, something got adrift in the crank case and wrecked the engine. The wreck was quickly removed and the Sterling engine used last year replaced.



Crowd Watching the Races From the River Bank. This Was the Free Field and Every Point of Vantage Was Occupied During the Races



Miss Minneapolis, Last Year's Winner of the Famous Championship Trophy

Of course this engine could not be tuned up properly but in spite of this drawback Miss Minneapolis ran well.

Whip-po'-Will Jr. is a duplicate of Baby Marold, which burned last year, and the twin six Van Blerck engine used in that boat had been rebuilt. This boat is 28 feet long and 7 feet 1½ inches breadth. The stern, like that



Miss Detroit II. Owner Wood and Mechanician Smith Looking Very Happy

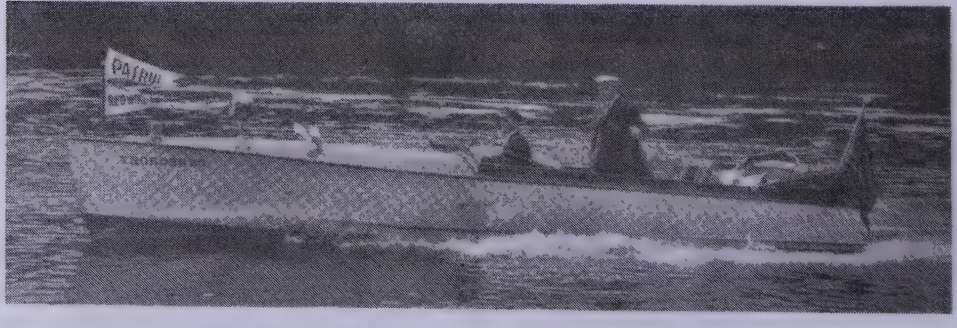
of Baby Marold, is built out. Wallace W. Tuttle rebuilt the engine. The bore is 6 inches, the stroke 7 inches, and at 1,725 revolutions the engine developed 565 h.p. It is equipped with a Leece-Neville starter and turns a 22 by 45-inch Columbian wheel.

Hawkeye II was built by Jim Kneeshaw, Steve Jenkins and George Granger at Lake George this year. In design she is similar to Miss Detroit II but has less freeboard. She is driven by the eight-cylinder 6 by 6-inch Van Blerck engine that was used in the first Hawkeye, which turns a 20 by 38-inch Hyde wheel.

Commodore Judson had gone to great expense to try to win the Gold Cup. He had nine men to look after his two boats and hired a barge and derrick so that the boats could be handled easily.

The first race had been set for Thursday, August 23d, but a heavy rainstorm made a postponement necessary. Late in the afternoon, however, Commodore Judson took Whip-po'-Will Jr. out for a spin over the course. The Commodore had the wheel, Orin Judson was at the engine and Jack Beebe, the builder of the boat, was on board. The boat started off well and the engine seemed to run beautifully. The few who watched the run as long as it lasted are confident that the boat was making better than 60 miles an hour. In making a turn, however, the boat skidded and capsized. The three men had to swim but were saved without any injury beyond a wetting. The barge with the crane lifted the boat out of the water; fortunately, there was only 12 feet where it sank, but much sand and dirt had penetrated every part of the engine and it was impossible to get it in shape in time to start again.

The next day the accident happened to Miss Minneapolis. There was another postponement, but with considerable hustling that boat was ready to start on Saturday, August 25th. Hawkeye II had in the meantime



Admiral Arthur L. Gibson Patrolling the Course in His Red Wing Runabout Thorobred



Miss Detroit II, Driven by a Sterling Engine, Breaking the Record in the Mile Trials at Minneapolis

gone out for a trial spin. She hit a submerged log, which bent her shaft and twisted the propeller, so that she was late when the first race was called on Saturday, August 25th.

Miss Detroit, with Gar Wood driving and Jay Smith as mechanician, got over the line 18 seconds after the gun. Miss Minneapolis, with Win Wood and Harry Groat on board, was 3 minutes later, and Hawkeye did not reach the line for more than an hour and went over the course to qualify. The course was 30 miles, five laps of 6 miles each. The turns were sharp because of the narrowness of the river. Miss Detroit had been fitted with a large rudder and was able to make the turns almost at full speed while Miss Minneapolis had to throttle down. On the third lap, just before reaching the home mark, Miss Detroit lapped Miss Minneapolis and she finally finished 10 minutes 4 seconds in the lead, having made the course in 40 minutes 59 seconds. Hawkeye II was driven by George Reiss and James Henshaw was mechanician. The boat jogged round the course slowly and qualified for the next race.

The conditions for the second race, on Sunday, were ideal. There was no wind and the water was very smooth. Miss Minneapolis and Hawkeye were both in better shape to race. Miss Detroit II got away first and she made the first lap in 7 minutes 5 seconds, which is at the rate of 59.5 miles an hour—a record. Miss Detroit II completed the course in 36 minutes 59 seconds, averaging 56.3 miles an hour. Miss Minneapolis averaged 52 miles an hour, and Hawkeye II, running on six cylinders, having cracked one, averaged 42.9 miles an hour.

The third race was between the two Misses; Hawkeye II started but had to retire because of engine trouble. Only one second separated the Misses at the start. At the end of the first lap Miss Detroit II led by 5 seconds and she drew ahead steadily until the finish, winning the race by 5 minutes 39 seconds. Her time for the course was 36 minutes 47 seconds and her average speed 56.5 miles an hour.

Miss Detroit II was the only boat to start in the speed trials. She made three runs each way of the measured course and averaged 61.723 statute miles an hour.



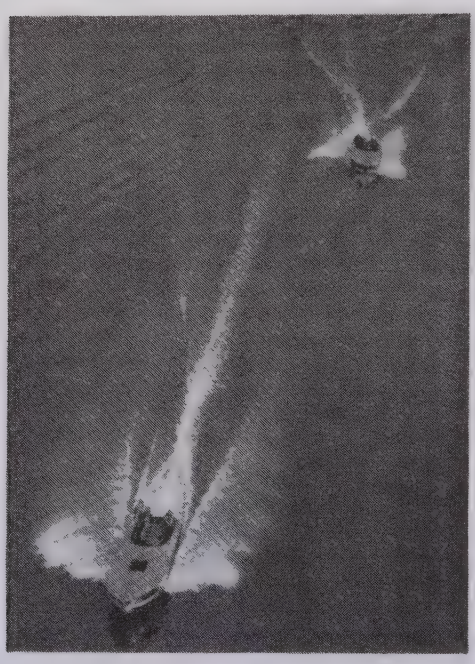
Miss Minneapolis on the Ways, Being Carefully Overhauled

The officials were: Board of Judges: Dr. J. F. Schefeik, Minneapolis; Harry Sampson, Jr., New York; Charles F. Chapman, New York. Timers: Al. Fray, Minneapolis; A. C. Templeton, New York; George W. Young, New York; C. T. Booth, Minneapolis.

Every effort had been made to get the Whip-po'-Will Jr. into shape again for these trials but it was found to be impossible, so much work had to be done. Com-



Whip-po'-Will Jr., Driven by a Van Blerck Engine, Showing a Great Turn of Speed Just Before Her Accident



View of Miss Detroit II Leading Miss Minneapolis in Third Race For the Cup, Taken From the Franklin Avenue Bridge, One-eighth Mile From the Start

modore Judson was naturally disappointed. Many who saw his boat run are of opinion that she would have been a prominent contender for honors and might have brought the Gold Cup East again. Two stands had been erected on the river front exactly one nautical mile apart. The judges occupied these stands and took the start and finish of each run. The fastest mile was at the rate of 54.381 nautical or 62.583 statute miles an hour. This was down the river. The best time made against the current was at the rate of 53.898 nautical miles an hour.

First Race, August 25th. Course, 30 Nautical Miles

Boat	1st Lap H. M. S.	2d Lap M. S.	3d Lap M. S.	4th Lap M. S.	5th Lap M. S.	Total H. M. S.
Miss Detroit II....	8:28	7:56	8:16	7:51	8:28	40:59
Miss Minneapolis .	13:53	9:32	9:20	9:13	9:05	51:03
Hawkeye II.....1	17:36	9:35	16:15	10:08	12:09	2:05:43

Miss Detroit II started 18 seconds late; Miss Minneapolis 3 minutes 1 second late; Hawkeye II 1 hour 7 minutes 7 seconds late.

Speed in Miles per Hour for Each Lap

Miss Detroit II	49.1	52.4	50.1	53	49.0	50.7
Miss Minneapolis ..	29.35	43.5	43.7	45.1	45.7	40.6
Hawkeye II	39.5	43.3	24.6	41	34.2	16.5

Second Race, August 26th

Boat	M. S.	M. S.	M. S.	M. S.	M. S.	M. S.
Miss Detroit II.....	7:05	7:24	7:23	7:23	7:44	36:59
Miss Minneapolis	8:07	8:01	8:02	8:01	7:53	40:04
Hawkeye II	8:39	9:43	9:47	10:13	10:03	48:25

Speed in Miles per Hour for Each Lap

Miss Detroit II	59.5	56.1	56.2	56.2	53.7	56.3
Miss Minneapolis ..	51.2	51.9	51.8	51.9	52.7	52.0
Hawkeye II.....	48.0	42.0	42.5	40.5	41.3	42.9

Detroit 7 seconds late; Miss Minneapolis 14 seconds late; Hawkeye 15 seconds late.

Third Race, August 27th

Boat	M. S.	M. S.	M. S.	M. S.	M. S.	M. S.
Miss Detroit II.....	7:05	7:21	7:20	7:36	7:25	36:47
Miss Minneapolis	7:10	8:35	8:51	9:11	8:39	42:26
Hawkeye II	8:14	Broke down and towed in.				

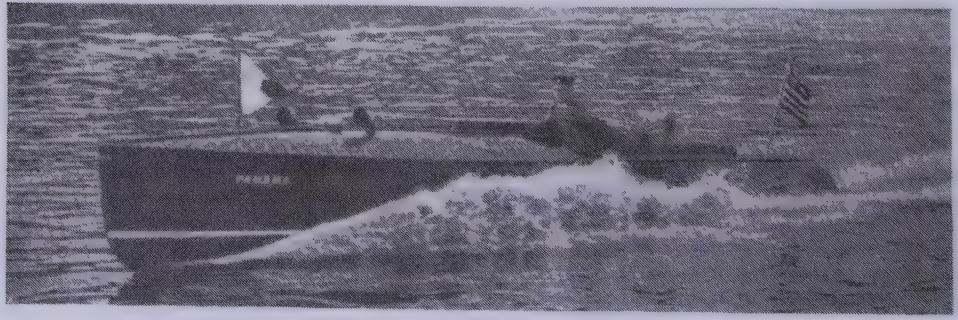
Miss Detroit II started 7 seconds late; Miss Minneapolis 8 seconds late; Hawkeye II 16 seconds late.

Speed in Miles per Hour for Each Lap

Miss Detroit II	58.6	56.5	56.6	53.3	55.7	56.5
Miss Minneapolis ..	52.6	48.5	46.9	45.2	47.9	49.0
Hawkeye II 50.5		.....				

The mile trials, Miss Detroit II, August 28th.—Six trials, three down and three up the course. The times in minutes and seconds: 1:07.3; 1:07.8; 1:06.4; 1:07.9; 1:06.2; 1:08.4. Average by the admiralty system 53.626 nautical or 61.723 statute miles an hour.

Previous record, Miss Minneapolis, 53.116 nautical or 61.083 statute miles an hour, made last year.



Panama, Owned and Built by E. D. Scofield, of St. Paul, Equipped With a Capital Engine, Patrolling the Course

Lydonia, Pride of the Lake Fleet

SINCE the day of her launching in 1911 Lydonia has been the largest and most attractive of the yachts on the Great Lakes. She was built from designs by William Gardner, who gave much thought and study in working out the details of her plans and in her interior arrangements, and she is a most attractive vessel in every way. She was built for William A. Lydon, President of the Great Lakes Dredge and Dock Company, and has been used every year since her launching. Now she has been turned over to the Navy Department and is fitting for a patrol boat to be put in service similar to that being performed by Corsair, Kanawha, Noma, Aphrodite and other well-known yachts.

The Lydonia easily passed the survey made by the Government officials, who were loud in their praise of her model, construction and general suitableness for the work to which she has been assigned, and, unlike many other yachts, she has not been ripped to pieces to convert her into a war vessel; but where interior fittings have had to be removed, these have been taken out carefully so that they may be reinstalled after the war and the yacht will be as good then as ever she was.

Lydonia is an ocean-going steam yacht of 497 gross tonnage. She is a steel vessel and was built by the Pusey & Jones Company at Wilmington, Del., under the supervision of William Gardner & Co. Previous to this yacht Mr. Lydon had another Lydonia, which was 168 feet long. He was so pleased with that vessel that, after using it for two years, he ordered the present yacht of that name. The general dimensions of the Lydonia are: length over all 214 feet, length water-line, 175 feet, breadth 26 feet 6 inches, depth 17 feet and draught 12 feet 3 inches. She is a very handsome vessel of the English type. The sheer is graceful and she is rigged with two polemasts which support the wireless antennæ.

The hull is of high tensile steel. It is divided into five watertight compartments by six steel bulkheads. The machinery occupies the two compartments amidships. The two spaces immediately forward and aft of the machinery space are taken up for the owner's and guests' accommodations and the officers' and the crew's quarters are forward.

The machinery consists of one four-cylinder triple-expansion engine with cylinders 16-inch, 26-inch, 30-inch and 30-inch diameter by 24-inch stroke, and steam is generated in a Scotch boiler. The yacht makes 12 knots under natural draught and 14 knots under forced draught. Special care was paid to the machinery, which is simple



S. Y. Lydonia, Built For William A. Lydon, of Chicago, From Designs by William Gardner & Co., and Recently Purchased by the U. S. Government



The Library, Looking Towards the Music Room



Music Room in the Main Deckhouse, Fitted and Furnished With Mahogany



The Dining Saloon, Which Will Accommodate Comfortably Eighteen Persons at Dinner



Another View of the Music Room, Looking Towards the Library

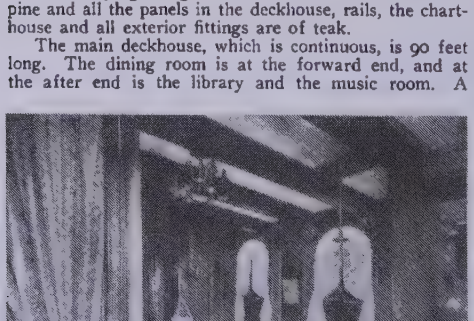


One of the Many Staterooms

in design and very economical to run. The coal bunkers carry sufficient fuel to give the yacht a cruising radius of 3,500 miles without recoaling. Then there is an electric lighting plant which furnishes current to illuminate the yacht, to supply the storage batteries and to furnish current for a Navy type, 5,000-c.p. searchlight which is installed on the foremast and operated from the bridge. There is a refrigerating plant, cold storage compartment, and a perfect system of heating and cooling and ventilation.

There is a berth deck, main deck, shade deck and the flying bridge, all of which are for the accommodation of the owner and his guests. Below the berth deck are storage rooms, the water tanks, etc. The flying bridge, with wings extending to each side of the yacht, gives a commanding view of everything for a long distance. An awning screens those on this bridge from the sun's rays. The shade deck is to the side of the house and affords a 100-foot promenade. The chartroom is on this deck under the flying bridge. The deck is of selected white pine and all the panels in the deckhouse, rails, the charthouse and all exterior fittings are of teak.

The main deckhouse, which is continuous, is 90 feet long. The dining room is at the forward end, and at the after end is the library and the music room. A



A Corner of a Stateroom

passageway inside the deckhouse joins all the deck saloons as well as affording access to the berth deck quarters and to the shade deck. The passageway, library and music room are finished in selected African mahogany with figured panels. The furniture, which was specially designed for this yacht, is also of African mahogany. The dining room is finished in Java teak and the carving is very handsome and artistic. The furniture is simple in design but rich without being ornate. At one side of the room is a handsome sideboard. The dining table is round and will accommodate comfortably eighteen persons. The galley and the pantry are also in the deckhouse with direct communication to the dining room.

The dining saloon is well lighted and ventilated. Heavy plate-glass windows, which can be dropped in fair weather, enable those seated at the dining table to have a never-ending panorama, and at night a cluster of electric lights over the table and several small lights around the sides of the room illuminate the room. The library is as a library should be, simple and elegant. The fittings and furniture are of mahogany. The large windows give lots of light and fresh air and the electric light fixtures are subdued. There is a desk, bookcases, chairs, settees in the library and in the music room, which adjoins, is a piano and phonograph. Over these two rooms are two very handsome stained glass domes from which the electroliers are suspended.

The Lydonia has wonderful deck space. The shade deck, which extends the full length of the deckhouse, is clear except for the chartroom and the skylights over the saloons and the ventilators. Wicker chairs and settees are scattered about this deck and under the awning one can be comfortable in any weather. On the main deck there is a large space aft of the deckhouse covered by an awning and another large space forward. This deck is of selected white pine and the rails, skylights, companionways, bulwark panels and the exterior of the deckhouse are of teak.

The owner's quarters are forward of the machinery space and are reached by a companionway from the passage in the deckhouse. They consist of three communicating staterooms, a bathroom, a sitting room and a lobby. The rooms are finished in white mahogany. The furniture is of red mahogany. The ceiling is paneled with white pine enameled and rubbed down to a dull smooth finish. Each stateroom has a large ornamental bed, a wardrobe, bureau, chiffonier, cheval glass, sofa and stationary wash-basin. The owner's sitting room, which connects with his stateroom, is fitted with a mahogany desk. Aft of the machinery space there are two single staterooms and a double stateroom which are finished in white mahogany with satinwood panels. These rooms are also reached by stairs from the central passageway in the deckhouse. There are two bathrooms in the after part of the vessel, which have tiled floors and sides and porcelain fixtures with nickel-plated fittings. The woodwork above the tiling is enameled gloss white. The bathtubs are equipped with running hot and cold, fresh and salt water, and all the basins have running hot and cold water. The plumbing throughout the yacht is open and exposed and the most modern in every detail.

Special attention was paid to the ventilation of all the living quarters between decks. In addition to large air-ports inside the hull, every stateroom and bathroom has an overhead skylight which is operated from below.

The crew's quarters are divided into two separate compartments, one for officers and the other for sailors.



The Spacious Sun Deck, Which Extends for 90 Feet

and each has a separate mess. There are accommodations for thirty men. The forecastle deck is raised level with the top of the bulwark rail and extends from the knight head to the side of the main deckhouse for the full width of the yacht. This gives much room and fine ventilation in the crew's quarters.

The Lydonia carries a 28-foot launch for the owner's use, a 20-foot power boat for the ship's use, one cutter, one dinghy and two lifeboats. It is an open secret that in the near future Mr. Lydon will place another order with William Gardner for a third yacht, which will be built just as soon as the war is over.



S. P. 86, Presented to the Navy Department by Captain John J. Phelps, of Hackensack, N. J.; Length, 60 Ft., Breadth 9 Ft. 6 In.; Equipped With Two 8-Cyl. Duesenberg Patrol Engines of 400 H.P. Each, Which Turn Columbian Allen-Craig Propellers, 27 by 34 In., 1,225 R.P.M. Speed 30.5 Knots

Insignia and Devices Worn by Naval Men

UNIFORMS of the soldiers and sailors are to be seen everywhere just now. The khaki of the Army and the blue cloth or white duck of the Navy are prominent in every city, town or village, and each man wearing these uniforms also has some decoration or mark that tells his rank. To understand these marks is second nature to an Army or Navy man but to the average public they are about as instructive as the Greek letters.

Uncle Sam is very particular about the way his soldiers and sailors are dressed and he is also particular about the decorations they wear, and in each branch of the service, rigid rules are made about dress. Readers of THE RUDDER are particularly interested in the Navy because so many yachtsmen have entered that service, and so this article tells what the cap devices, shoulder marks, collar devices and rating badges mean. The illustrations are taken from the Uniform Regulations of the Navy Department.

Just now the service dress is the only one used in the Navy. There is the blue cloth service dress and the white service dress. The white service dress has been used during the heated term but now that cool weather is coming it will be replaced by the warmer costume.

Pay a visit to a battleship or to a Navy yard and you may catch a sight of an officer wearing a cap which has the visor decorated with sprigs of oak leaves and acorns embroidered in gold. You should know at once that this is an officer with flag rank. A glance at his sleeves, where he may have one broad stripe and two narrow stripes of gold lace, will tell at once that he is a vice-admiral. Or a glimpse of his collar, where there will be three stars and a foul anchor in silver, will also show that he is a vice-admiral.

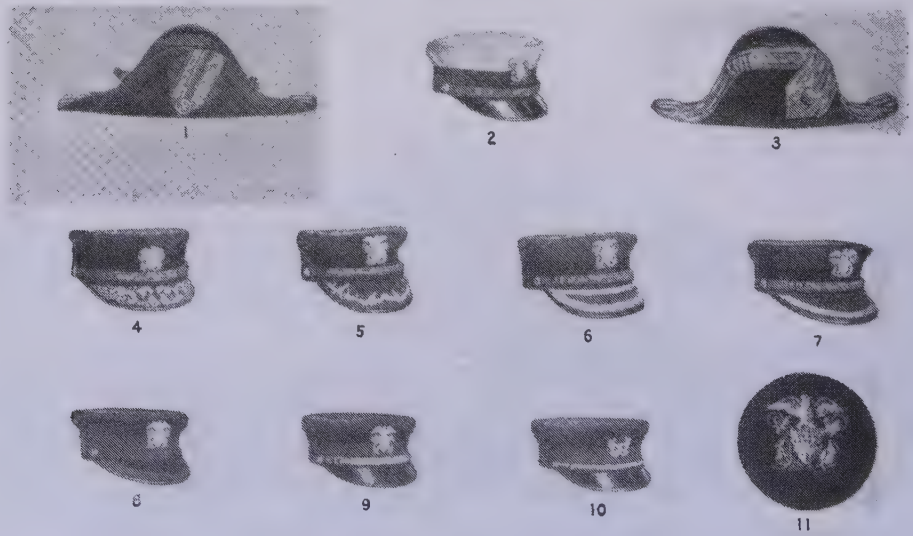
A captain can very easily be identified, because he will wear a spread-eagle and an anchor on his collar and four gold stripes and a star on his sleeves.

Each line officer wears a silver foul anchor embroidered on his collar. Officers of other corps wear devices which identify the corps to which they belong.

It is the same way with the enlisted men. They wear devices which tell their specialty, their rank or rating, and stripes which denote the length of time they have been in the service. A man who wears a white silk eagle, three chevrons and an arc over a white star, is a chief master-at-arms. A quartermaster is known by the wheel with which he is decorated, a printer by a book, a storekeeper by two crossed keys, and a musician by a lyre.

With the warrant officers and mates the men with the higher ranks wear silver devices while their subordinates have devices of gold.

The devices of the men of the Naval Reserve force are the same as those for the regular Navy men except



COCKED HATS, CAPS AND CAP DEVICES

1 Cocked Hat. 2 White Cap, All Officers. 3 Cocked Hat. 4 Flag Officers. 5 Captains and Commanders. 6 Staff Officers, Flag Rank. 7 Staff Officers, Captains and Commanders. 8 Chaplain. 9 Other Officers. 10 Warrant Officers, Mates and Paymaster Clerks. 11 Cap Device, Commissioned Officers.

that on the collars of the Reserve force men the device on the cap of a commissioned officer of the Navy is used instead of the foul anchor.

First of all come the caps worn. The many styles are shown in the picture. All commissioned officers wear a device, shown in Fig. 11, which is a silver shield surmounted by a spread-eagle, the whole placed upon two crossed foul anchors. For warrant officers, mates and paymaster's clerks, the device is two gold foul anchors crossed. The various hats and caps are illustrated in the picture on the preceding page.

Collar Devices

The collar bears devices indicating rank and corps as follows:

Admiral of the Navy, four silver stars of five rays each, the two end stars surcharged upon gold foul anchors, the crowns of the anchors pointing towards each other.

Admiral, four silver stars, the rearmost one from the front edge of the collar surcharged on a gold anchor.

Vice-Admiral, three silver stars and a silver foul anchor in rear of the stars.

Rear-Admiral, two silver stars and a silver foul anchor in rear of the stars.

Captain, a silver spread-eagle and a silver foul anchor.

Commander, a silver oak leaf and a silver foul anchor.

Lieutenant-Commander, a gold oak leaf and a silver foul anchor.

Lieutenant, two silver bars and a silver foul anchor. The bars being separated the width of a bar and at right angles to the upper edge of the collar.

Lieutenant, junior grade, one silver bar and a foul anchor.

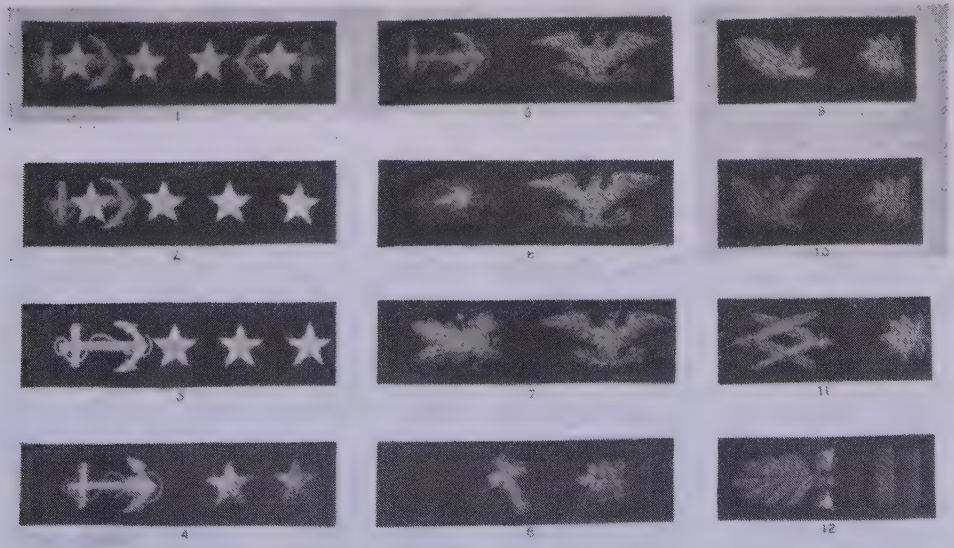
Ensign, a silver foul anchor.

Commissioned staff officers wear the same collar devices as those worn by line officers with whom they rank except that they substitute the proper corps device for the anchor. That of the medical corps is a silver acorn upon a gold spread oak leaf. That of the pay officers is a silver oak leaf sprig of three leaves and three acorns. Professors of mathematics are designated by a silver oak leaf and an acorn. Naval constructors wear a gold sprig of two live-oak leaves and an acorn. Civil engineers are recognized by their wearing two crossed silver sprigs each of two live-oak leaves and an acorn. Medical reserve officers wear a gold acorn embroidered upon a silver oak leaf. The insignia for dental officers is a gold spread oak leaf with a silver acorn on either side of the stem. Chaplains wear on the collar of their coats a Latin cross embroidered in silver and inclined backward at an angle of 15° from the vertical.

Chief petty officers wear coats with rolling collars and can easily be distinguished from commissioned and warrant officers, whose coats are tight fitting with standing collars. On the sleeve the chief petty officers wear devices which tell their rank. These are as follows:

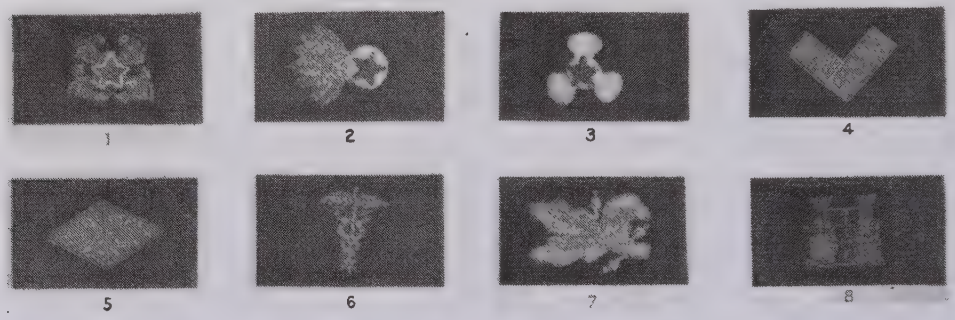
Chief boatswain, two foul anchors crossed, embroidered in silver surcharged at the point of crossing with a gold five-pointed star.

Chief gunner, a flaming spherical shell embroidered in silver, flaming horizontal and pointing to the rear, surcharged in the center of the shell with a gold five-pointed star.



COLLAR DEVICES ON SERVICE COAT, SHOWING RIGHT SIDE OF COLLAR

1 Admiral of the Navy. 2 Admiral. 3 Vice-Admiral. 4 Rear-Admiral. 5 Captain. 6 Medical Corps, Captain. 7 Paymaster, Captain. 8 Chaplain. 9 Professor of Mathematics, Rank, Lieutenant-Commander. 10 Naval Constructor, Rank, Lieutenant-Commander. 11 Civil Engineer, Rank, Lieutenant-Commander. 12 Dental Officer, Rank, Lieutenant.



COLLAR DEVICES

1 Chief Boatswain. 2 Chief Gunner. 3 Chief Machinist. 4 Chief Carpenter and Carpenter. 5 Chief Sailmaker and Sailmaker. 6 Chief Pharmacist and Pharmacist. 7 Chief Pay Clerk. 8 Mates.

Chief machinist, a three-bladed propeller embroidered in silver, surcharged at the center with a gold five-pointed star.

Boatswains, gunners and machinists wear similar insignia but the devices are embroidered in gold and the surcharged stars in silver.

Chief carpenter and carpenter, a carpenter's square, point down, embroidered in silver and in gold respectively.

Chief sailmaker and sailmaker, a diamond embroidered in silver and in gold respectively.

Chief pharmacist and pharmacist, a caduceus embroidered in silver and in gold respectively.

Chief pay clerk, the pay corps device, a sprig of three oak leaves and three acorns embroidered in gold.

Mates, a binocular glass embroidered in gold for less than twenty-years' service and in silver after twenty-years' service.

Sleeve Marks

Gold braid and stars on the sleeves of officers signify the rank of the wearer. The sleeve insignias of rank are as follows:

Admiral of the Navy, two stripes of 2-inch gold lace, the lower edge being two inches from and parallel to the edge of the sleeve. Between these two stripes is one stripe of 1-inch lace and the stripes are ¼-inch apart.

Admiral, one stripe of 2-inch lace with three stripes of ½-inch lace above it.

Vice-Admiral, one stripe of 2-inch lace with two stripes of ½-inch lace above it.

Rear-Admiral, one stripe of 2-inch lace and one stripe of ½-inch lace above it.

Captain, four stripes of ½-inch lace.

Commander, three stripes of ½-inch lace.

Lieutenant-Commander, two stripes of ½-inch lace with one stripe of ¼-inch lace between the stripes.

Lieutenant, two stripes of ½-inch lace.

Lieutenant, junior grade, one stripe of ½-inch lace and one stripe of ¼-inch lace.

Ensign, one stripe of ½-inch lace.

The line officers wear a star of five rays embroidered in gold on the outside of each sleeve.

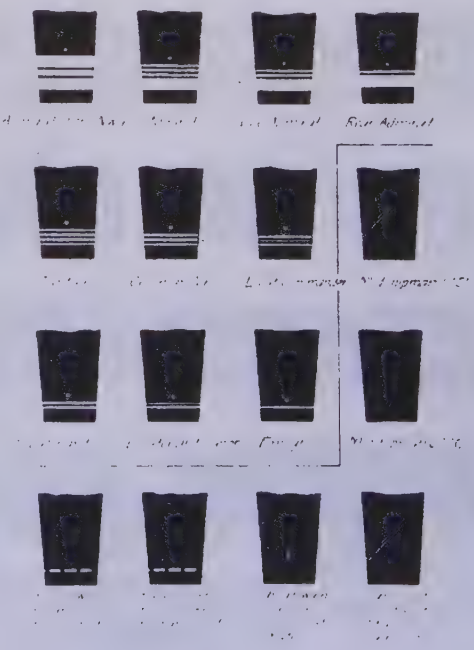
Staff officers wear the same stripes as those prescribed for line officers with whom they rank, but not the stars. The corps to which they respectively belong are indicated by bands of colored cloth around the sleeves filling the intervals between the gold-lace stripes. When only one stripe is worn the cloth shows above and below the stripe. The colors and materials are:

Medical officers, dark maroon velvet.

Pay officers, white cloth.

Professors of mathematics, olive-green cloth.

Naval constructors, dark violet cloth.



Insignia of Rank on Sleeve

Civil engineers, light blue velvet.
Medical reserve officers, crimson cloth.
Dental officers, orange-colored velvet.

Chaplain, stripes of lustrous black braid of the same size, number and disposition as for line officers of the same rank.

Chief boatswains, chief gunners and chief machinists, one star and one stripe of ⅓-inch gold lace, woven with dark blue silk thread for widths of ½-inch at intervals of 2 inches.

Chief carpenter, chief sailmaker, chief pay clerk and chief pharmacist, the same as for chief boatswain but without the stars.

Boatswains, gunners, machinists and mates, one star placed 4 inches from the edge of the sleeve, but no stripes.

Carpenters, sailmakers, pharmacists and pay clerks, no sleeve marks.

Ratings

The rating badge is worn by all petty officers of the seaman branch midway between the shoulder and elbow on the right sleeve and by all other petty officers on the left sleeve. It is worn on the blue coat and white coat of chief petty officers, commissary steward and first musician, and on the overshirt and jumpers of other petty officers.

The rating badge is a spread-eagle above a specialty mark and a class chevron. The chevrons are made of stripes of cloth ¾-inch wide, separated ¼-inch and sewed flat. For blue clothing the chevrons are made of scarlet cloth and for white clothing of blue cloth. Chief petty officers wear chevrons of three stripes with an arch of one stripe forming the arc of a circle between the ends of the upper stripe of the chevron. The specialty mark is in the center of the field under the arch, the eagle resting on the center of the top of the arch. Petty officers, first class, wear three stripes in the chevron; petty officers, second class, two stripes; and petty officers, third class, one stripe.

Specialty Marks

The specialty marks shown in the illustrations Figs. 1 to 18 (see page 650) are as follows:

Fig. 1. Master at Arms.
Fig. 2. Boatswain's mates, coxswains.
Fig. 3. Quartermasters.
Fig. 4. Blacksmiths, ship fitters.
Fig. 5. Sailmakers' mates.
Fig. 6. Printers.
Fig. 7. Carpenters' mates, plumber and fitters, painters.
Fig. 8. Turret captains.
Fig. 9. Gunner's mates.
Fig. 10. Storekeepers.
Fig. 11. Yeomen.
Fig. 12. Electricians.
Fig. 13. Machinists' mates, boilermakers, water tenders, coppersmiths, oilers.
Fig. 14. Hospital Corps (red cloth).
Fig. 15. Bandmasters, musicians.
Fig. 16. Commissary stewards.
Fig. 17. Ship's cooks and bakers.
Fig. 18. Bugler.



Navy Buttons

Distinguishing Marks

The men also wear distinguishing marks, some of which are in addition to the rating badges and some of which take the place of the ratings. These marks are embroidered in white silk on blue clothing, and in blue silk on white clothing.

An enlisted man who has qualified as a seaman gunner wears a flaming spherical shell so placed that the top comes one inch below the point of the chevron of the rating badge. If he is not a petty officer it takes the place of the rating badge.

Every enlisted man regularly detailed by the commanding officer as a gun captain, except at a secondary battery gun (less than 4-inch caliber), wears as a distinguishing mark a gun, on the arm opposite to that on which the rating badge is worn, midway between the shoulder and elbow.

A man who has qualified as a gun pointer, second class, wears the gun pointer's mark on the opposite arm to that on which the rating badge is worn. For a gun



Chief Master-at-Arms



Boatswain's Mate, First Class



Gunner's Mate, Second Class



Quartermaster, Third Class

pointer, first class, the mark is the same with a star above it.

Members of turret, gun and torpedo crews that make exceptionally high scores and men of the engineer division recommended for distinction wear the letter E below the chevron, or below the seaman gunner's mark, and by men not rated in place of the rating badge. For gunnery and torpedo the E is white on blue uniforms and blue on white uniforms. For engineering the E is red.

Expert riflemen wear upon the right sleeve about halfway between the wrist and elbow the sides of a square, inclosing a circle and a bull's eye.

Radio operators and electricians wear a mark that resembles lightning on the arm below the chevron.

Gunners' mates, second class or higher, qualified in torpedoes and mines, wear a torpedo below the chevron.

A bugler wears a bugle in place of a rating mark but without any chevron or eagle. A shipwright wears the two crossed axes, the specialty mark of the carpenters' mate, but without any chevron or eagle.

The Geneva cross of red cloth is worn by hospital apprentices on the left arm in place of a rating badge.

Ship's cooks, third and fourth class; bakers, second class, and officers' stewards and cooks wear the specialty mark for ship's cooks, first class, but without eagle or chevrons.

Signalmen, first and second class, wear the specialty mark of a quartermaster but without chevron or eagle.

Musicians, first and second class, wear the specialty mark of a bandmaster but without eagle or chevrons. They also wear a metal lyre device on the collar.

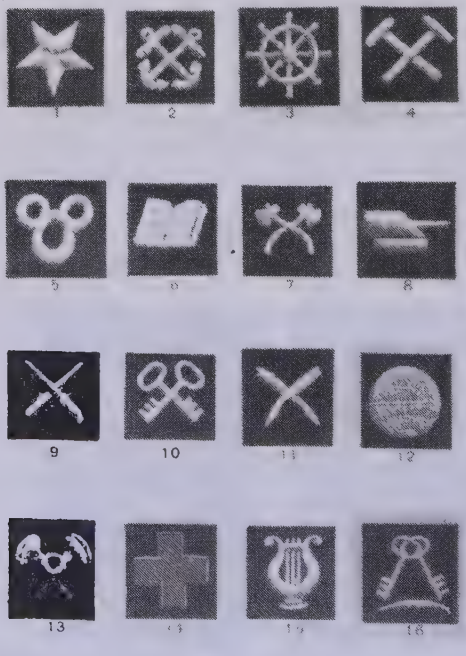
The figure-eight knot, two inches long, signifies that the wearer has passed through the rating of apprentice.

Service stripes are worn by all enlisted men on the left sleeve. These stripes are of scarlet cloth on blue clothes and blue cloth on white clothes. One stripe is worn for each complete term of enlistment. For petty officers who hold three consecutive good-conduct badges the service stripes are of gold lace.

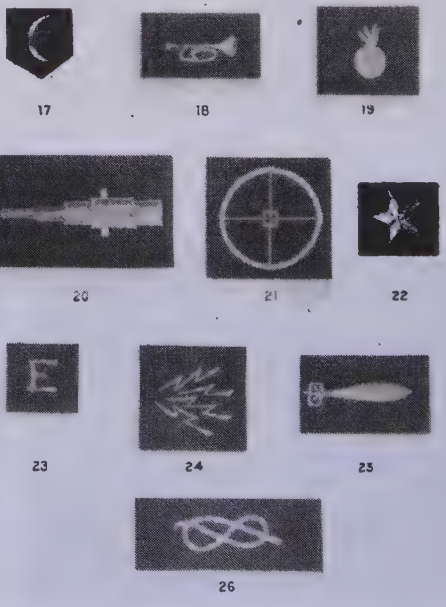
The enlisted men who are not petty officers wear on the overshirt and jumpers a strip of braid $\frac{3}{8}$-inch wide known as a branch mark. This braid is placed on the shoulder seam of the sleeve and extends entirely around the arm. Men of the seaman branch wear this mark on the right arm. The braid is blue on white clothing and white on blue clothing. Men of the artificer branch, engine room force wear a similar mark on the left arm. The mark is red braid. Hospital apprentices, shipwrights, musicians, buglers, and commissary and messmen branches wear no branch stripe.

The distinguishing marks shown in the illustrations are as follows:

Fig. 19. Seaman gunner.
Fig. 20. Gun captain.
Fig. 21. Gun pointer, second class.
Fig. 22. Gun pointer, first class.
Fig. 23. Turret gun and torpedo crew.
Fig. 24. Radio operator.
Fig. 25. Torpedoman.
Fig. 26. Ex-apprentice.



Specialty Marks



Distinguishing Marks

Racing Ends in Southern New Jersey

By J. Kinzer Shell, Jr.

THE Sea Isle City Y. & M. C. defeated the Chelsea Y. C. for point honors in the third race-meet of the South Jersey Y. R. A., held over the course and under the auspices of the winning club. The Sea Isle folk, led by Vice-Commodore George H. Straubmuller, secured fifteen points, the Chelsea Y. C. fourteen points, the Ocean City Y. C. four points and the Stone Harbor Y. C. three points.

The winners of the five events held were as follows:

Open Boats, Rating Under 40. Selma, owned by George H. Straubmuller, of the Sea Isle City Y. & M. C.

Open Boats, Rating 40 to 50. George S., owned by C. H. Strecher, of the Sea Isle City Y. & M. C.

Open Boats, Rating Over 50. Selma II, owned by George H. Straubmuller, of the Sea Isle City Y. & M. C.

Cruisers, Rating Under 40. Margeth, owned by J. N. Bower, of the Chelsea Y. C.

Cruisers, Rating Over 40. Laureba, owned by Harry D. Le Cato, of the Ocean City Y. C.

Selma I and Selma II, owned by George H. Straubmuller of the home club, following the style set by James M. Rowland of the Ocean City Y. C., won two races during the course of the regatta. The Selma I won the open boat class for boats rating under 40, while the Selma II, which has been a consistent performer in the last two years, won in the open boat class rating over 50. The other winner of the home club was in the open boat class rating from 40 to 50, when the George S., owned by C. H. Strecher, finished ahead of the Chelsea representatives.

The only win secured by the Chelsea Y. C. was in the race for cruisers rating under 40, when Margeth, owned by J. N. Bower, crossed the finish line by a margin of 30 seconds, after an exciting contest around the Island course. The Chelsea Club picked up seconds in the two upper class of open boats and two thirds and a fourth. The other winner was Harry D. Le Cato of the Ocean City Y. C., when the Laureba won without competition in the higher class of cruisers.

The best race of the regatta was in the cruiser class rating under 40, when Margeth of Chelsea competed against Mascot, owned by Charles Heiber of the Columbia Y. C. of Bridesburg and the flagship of the Delaware River Yachtsmen's League. Margeth gave Mascot an allowance of 26 seconds. Mascot's owner, mistaking the starting time, got away poorly, losing 50 seconds. This error cost Mascot the race, as Margeth won by 50 seconds.

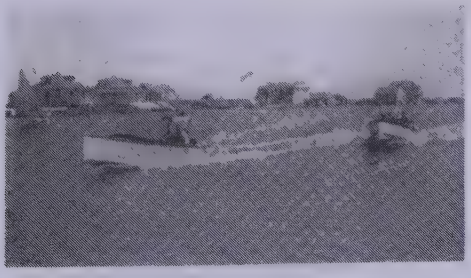
The spectacular race of the race-meet was that of the running of Selma II in the open boat class rating over 50. The Sea Isle craft started from near the scratch mark, conceding time allowances up to 4 minutes to slower boats. She was in the lead shortly after the start and at the finish had lapped Foggy Dew, owned by J. L. Appleton of Chelsea.

The summary is as follows:

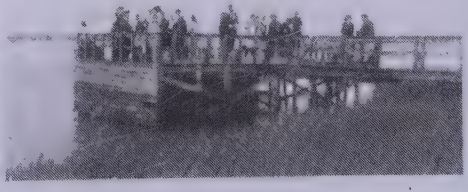
Boat, Owner and Club	Allowance M. S.	Elapsed Time H. M. S.	Cor'ed Time M. S.
Open Boats, Under 40 Rating. Course, 6.08 Miles			
Selma, G. H. Straubmuller, S. I. C...	2:18	47:56	45:38
Mary, V. Simon, Sea Isle City	Scr.	46:49	46:49
Peggy R., B. C. Riter, Stone Harbor..	12:14	1:04:15	52:01
Nadine, B. G. Frayer, Chelsea	5:49	59:33	53:44
Cardine, F. G. Shipper, Sea Isle City ..	5:57	Did not finish.	
Open Boats, 40 to 50. Course, 6.08 Miles			
George S., C. H. Strecher, Sea Isle City	Scr.	32:22	32:22
Seamahr, F. C. Rollman, Chelsea	:33	40:30	39:57
Open Boats, Over 50. Course, 9.12 Miles			
Selma II, G. H. Straubmuller, S. I. C.	6:46	31:18	24:32
Foggy Dew, J. L. Appleton, Chelsea ..	10:36	46:29	35:53
Sara Jean, M. R. Gana, Chelsea....	Scr.	36:50	36:50
Slick, F. F. McCall, Chelsea.....	2:50	48:23	45:33
Cruisers, Under 40. Course 6.08 Miles			
Margeth, J. N. Bowers, Chelsea.....	3:54	47:55	44:01
Mascot, Charles Heiber, Columbia....	4:23	49:14	44:51
Bubble, G. L. Markland, Stone Harbor	9:09	57:05	47:56
Cruisers, Over 40. Course, 6.08 Miles			
Laureda, H. D. Le Cato, Ocean City..	....	49:56	49:56

Stone Harbor Regatta

The representatives of the Chelsea Y. C. came back into their own in the final race-meet of the South Jersey Y. R. A., held over the course and under the sanction



George S., C. H. Strecher, Sea Isle City, Owner, Winning in Open Boat Class at South Jersey Y. R. A. Race-Meet



Spectators at Stone Harbor Who Ventured Out Between Showers to Watch the Racers

of the Stone Harbor Y. C. Despite the small number of entries, which was materially affected by the terrific thunder and rain storm which swept the Southern inland waterways of New Jersey from Atlantic City to Cape May, there were a sufficient number of boats in the seven races held to make the regatta a success and to permit the Chelsea Y. C. to obtain premier honors in points for the third successive season of competition of the South Jersey Association.

The winners of the seven races follow:

Open Boat Class, Rating Under 40. Selma, owned by George H. Straubmuller, of the Sea Isle City Y. & M. C.

Open Boat Class, Rating 40 to 50. Seamahr, owned by F. C. Rollman, of the Chelsea Y. C.

Open Boat Class, Rating 50 to 60. Selma II, owned by George H. Straubmuller, of the Sea Isle City Y. & M. C.

Open Boat Class, Rating Over 60. Sara Jean, owned by M. R. Gana, of the Chelsea Y. C.

Cruisers, Rating Under 40. Margeth, owned by J. N. Bower, of the Chelsea Y. C.

Cruisers, Rating Over 40. Laureba, owned by Harry D. Le Cato, of the Ocean City Y. C.

Express Cruiser, Sarah Jane, owned by W. H. Handlan, of the Chelsea Y. C.

The Chelsea Y. C. won four of the seven events. Two went to Sea Isle City and the other event to Ocean City. The Chelsea folks had to be contented with dividing honors in the open boat classes with the Sea Isle City skippers. Each club won two events, the two Selmas of George H. Straubmuller again repeating their double victory of the week previous at the home club.

The Selma I had no trouble in winning in her class. She started from scratch and overtook the limit boat at the conclusion of the first round of 3 nautical miles.

The victory of Selma II was also comparatively easy, for the three competitors against which she was pitted broke down or were disabled. Foggy Dew developed engine trouble at the start and lost several valuable minutes. Silver Heels, owned by Arthur Gilmore of the home club, after getting away to a good start, sprang aleak, and while the skipper was bailing out water, the boat ran on the bar near the lower end of the course.

The concluding race of the day between the two express cruisers, Sarah Jane, owned by W. H. Handlan, and Charlou II, owned by Commodore William Metzger, both of the Chelsea Y. C., proved to be a fitting climax to the wind-up of the season. Charlou II had an allowance of 2 minutes 34 seconds, which Sarah Jane cut down considerably on the first lap. Turning the buoy on the upper end of the course, Sarah Jane was just astern of Charlou II. She nosed ahead in the final half-mile, winning by a second.

Due to a misunderstanding there was a dispute in the cruiser class for boats rating less than 40. Bubble, owned by Commodore George L. Markland of the home club, was leading Margeth, owned by J. N. Bower, at the conclusion of the first of the two-lap contest. The regatta committee, thinking that the boats had completed the course, called them before they learned of their mistake. Margeth had made up a considerable amount of the time allowance and if the race had been continued to its conclusion, the Chelsea boat would have been an easy winner.

The summary of the race-meet is as follows:

Boat, Owner and Club	Allow. M. S.	Elapsed-Time H. M. S.	Corr'ted Time H. M. S.
Open Boats, Under 40 Rating			
Selma I, G. H. Straubmuller, S. I. C.	Scr.	48:11	48:11
Peggy R., B. C. Riter, Stone Harbor..	9:47	1:05:33	55:46
Peggy, C. Hunsicker, Stone Harbor...	5:50	1:05:51	1:00:01
Juniata, McKearney, Ocean City.....	11:19	1:15:20	1:04:01
Open Boats, 40 to 50. Course, 9 Miles			
Seamahr, F. C. Rollman, Chelsea.....	7:35	57:21	47:46
Etta, Fritz, Ocean City	Scr.	Did not start.	
Open Boats, Over 50. Course, 9 Miles			
Selma II, G. H. Straubmuller, S. I. C...	Scr.	48:18	48:18
Foggy Dew, J. L. Applegate, Chelsea..	4:17	1:14:29	1:10:12
Silver Heels, A. Gilmore, Ste. Har...	3:36	Broken rudder.	
Clara D., Dr. Hitch, Stone Harbor ...	:08	Broke down.	
Cruisers, Over 40 Rating. Course, 3 Miles			
Laureba, H. D. Le Cato, Ocean City..	2:21	21:13	18:52
Cruisers, Under 40 Rating. Course, 3 Miles			
Margeth, J. N. Bowers, Chelsea	:03	23:47	23:44
Bubble, G. L. Markland, Stone Harbor	2:40	28:09	25:29
Express Cruisers. Course, 6 Miles			
Sarah Jane, W. H. Handlan, Chelsea..	Scr.	40:07	40:07
Charlou II, Wm. Metzger, Chelsea....	2:34	42:42	40:08
Open Boats, Over 60 Rating. Course, 6 Miles			
Sara Jean, M. R. Gana, Chelsea	Scr.	43:44	43:44

Schermerhorn Cup Race

The I. H. Y. C., in a light breeze, won the Schermerhorn Cup in the annual race held over the course of the Island Heights Y. C. The I. H. Y. C., sailed by Dr. "Al" Mulford and his able crew, was pitted against Edith, owned and sailed by Captain A. D. Cummins.



Selma, G. H. Straubmuller, Sea Isle City, Owner, a Consistent Winner



Stone Harbor Y. C. Officials Officiating in the Storm

The Edith, after going around the course of 6¾ nautical miles, retired from the contest, far astern.

The race, which is an annual affair, has been won the majority of times by the boats of Barnegat Bay, and Island Heights continues to keep possession of the trophy. The I. H. Y. C. proved to be the better drifter in the first half of the contest, although there was a light breeze stirring which at times kept the boats from being becalmed. She drew away from Edith in the first half of the race and then finished the contest alone and as she pleased.

The summaries of the races of importance held are as follows:

SNEAKBOXES. 20-Footers

Boat and Captain	Finish H. M. S.	El. Time H. M. S.
Vanity, Ralph Patterson	3:22:45	46:47
Pollywog, B. Wilbur	3:24:25	47:00
Mollie, Captain Nugent	3:31:29	53:24
Ataboy, J. Truitt	3:44:00	1:04:00
Breakdown, H. McKaig	Did not finish.	

SNEAKBOXES. 16-Footers

Quakermaid, Margaret Truitt	3:38:56	53:56
Soup	3:40:50	56:30

SPEED-BOAT RACE

Gem, W. C. Alexander	3:31:00	10:51
Snap Shot, James Gibbs	3:35:42	15:23

OPEN BOATS Under 6-H.P.

Selma, H. Kean	3:20:07	25:07
Skipper, Mrs. Frank Henry	3:20:31	25:31
Bob, Mrs. Blank	3:21:10	26:10
Scottie, N. Scott	3:23:00	28:00
Peanuts, C. Hierholzer	3:25:00	30:00
Thos. P., T. Kelly	3:25:35	30:35
*Fliver, L. Bassett	Did not finish.	
*We Doch, R. Truitt	Did not finish.	

* We Doch became disabled and was towed in by Fliver.

Ship John Cruiser Race

The cruiser Pickaninny, owned and piloted by Messrs. Bell and Taylor of the Camden M. B. C., won the Ship John cruiser championship of the Delaware River Y. R. A. on Saturday, September 8th.

Eight cruisers competed in the 46-nautical-mile contest, which started and finished at the anchorage of the Camden B. M. C., with the turning point at Bordentown at the entrance of the Delaware and Raritan Canal. The boats raced in a driving rainstorm and hard Nor'easter.

The win of Pickaninny was the second of the season, she having carried off premier honors in the annual cruiser championship of the Delaware River Y. R. A., under whose auspices the Ship John contest was held. While the victory of Pickaninny was the feature of the race, the contest between Helma, owned by William Fredericks, of the United B. C. of Wilmington, and Waukesha, owned by Clifford R. Bell, of the Camden M. B. C., for the W. Freeland Kendrick Trophy for the best elapsed time, was spectacular. At no time during the course of the contest were the two boats separated by more than a boat's length. The two high raters rounded the buoy at Bordentown almost simultaneously. Near Burlington Island the engine of Waukesha missed several times, throwing the boat back a length. She, however, made up the distance in the run to the lower end of Pettys Island. At the turn the two boats were again on even terms. In the last half mile Helma put on a spurt and crossed the finish line with a lead of 5 seconds. Due to her time allowance she was able to finish third in the race.

The summary of the race follows:

Boat, Owner and Club	Allow'ce H. M. S.	Elapsed Time H. M. S.	Cor.'ted Time H. M. S.
Pickaninny, Bell and Taylor, Camden	52:46	5:29:09	4:36:23
Eva Dor, J. A. Robbins, Riverside	30:14	5:07:08	4:36:54
Helma, Wm. Fredericks, United	16:33	4:58:45	4:42:12
Sweetheart, George Porter, United	20:25	5:17:54	4:57:29
Waukesha, C. R. Bell, Camden	Scr.	4:58:50	4:58:50
Berthela, J. W. Broomhead, Keystone	1:24:29	6:26:04	5:01:35
Clio, H. L. Jarvis, Anchor	1:44:05	6:49:02	5:04:57
Sue M., C. A. Morrell, Adelphia	15:02	5:33:36	5:18:34

Delaware League Races

Close and exciting finishes marked the fourth and final race-meet of the Delaware River Yachtsmen's League, held on the Delaware River on Saturday, September 8th, from the Columbia Y. C. of Bridesburg to the Wissinoming Y. C. There were six events, three for cruisers, two for glass cabins and one for open boats.

Due to capturing honors in three of the six races and taking all three places in the upper class of glass cabin boats, the Farragut Sportsmen's Association captured premier honors in the point score, having thirteen points to its credit. The Wissinoming Y. C. finished second with nine points, while the Riverside Y. C. and the Columbia Y. C. tied for third place with five points each, and the Camden Y. C. secured two points.

Eight cruisers faced the starter in the race for boats racing in the under 35 class. Hattie Bert, owned by Harry Brightley, Farragut S. A., with a time allowance of 12 minutes 32 seconds, was the winner of the 15-nautical-mile contest by the narrow margin of 22 seconds. She nosed out Jennie S., piloted by George Stock, Wissinoming Y. C. Jennie S. started from the scratch mark and conceded allowances up to 15 minutes. She caught the fleet with the exception of Hattie Bert. Dora II, owned by Bruno Aireshoff, Riverside Y. C., which was the limit boat, finished third, with Mazeppa, owned by C. W. Phillips, Columbia Y. C., fourth. The other four boats entered in the contest failed to finish owing to engine trouble.

Mascot, owned by Commodore Charles Heiber, of the Columbia Y. C. and President of the League, was the winner in the cruiser division rating between 35 and 40. Deceiver, owned by C. P. Bond of Farragut, with an



Peggy, Samuel Whan, Chelsea Y. C., Owner

allowance of 1 minute 54 seconds, ran rings around Helma, owned by William Fredericks, United and Riverside Y. C. ' In the morning Helma had won the time prize in the special trophy cruiser race of the Delaware River; but in the afternoon she was shown some real speed by Deceiver, which traversed the 15-nautical-mile course in 1 hour 39 minutes 12 seconds, 3 minutes faster on actual time than Helma. Eva Dor, owned by J. A. Robbins, of the Riverside Y. C., which had finished second in the special trophy contest, was third in the higher class of cruisers, being but 3 seconds astern of Helma.

The summary of the race-meet is as follows:

CRUISERS, Rating Under 35. 15 Nautical Miles

Boat, Owner and Club	Allow'ce H. M. S.	Elapsed Time H. M. S.	Corr'cted Time H. M. S.
Hattie Bert, H. Brightley, Farragut	12:32	2:12:25	1:59:53
Jennie S., Geo. Stock, Wissinoming.	Scr.	2:00:15	2:00:15
Dora II, B. Aireshoff, Riverside ..	15:00	2:30:50	2:15:50
Mazeppa, C. W. Phillips, Columbia...	1:35	2:17:27	2:15:52
Reba B., H. Knowles, Camden	17:30	Did not finish.	
Minnie B., C. B. Donovan, Camden..	5:00	Did not finish.	
Plover, J. Perkins, Camden	4:57	Did not finish.	
Martha E., Chas. High, Camden	:03	Did not finish.	

CRUISERS, Rating 35 to 40. Course, 75 Miles

Mascot, Chas. Heiber, Columbia ..	Scr.	1:53:23	1:53:23
Helen T., C. Townsend, Wissinoming.	5:52	2:03:18	1:57:26
Admiral, Thos. Kelly, Jr., Columbia	12:12	2:13:10	2:00:58

CRUISERS, Rating Over 40. Course, 15 Miles

Deceiver, C. P. Bond, Farragut	1:54	1:39:12	1:37:18
Helma, W. Fredericks, Riverside ..	Scr.	1:42:13	1:42:13
Eva Dor., J. R. Robbins, Riverside..	4:50	1:47:06	1:42:16

GLASS CABINS. Rating Under 35. Course, 10 Miles

Lillian II, E. J. Crosby, Camden ..	Scr.	1:43:40	1:43:40
Loretta, Lane & Driefus, Wissinoming	7:12	Did not finish.	

GLASS CABIN, Rating Over 40. Course, 10 Miles

Hannah II, Wm. Schroeder, Farragut	4:05	1:27:35	1:23:30
Margaret C., Geo. Cliver, Farragut..	Scr.	1:31:37	1:31:37
We Du, E. Rainey, Farragut.....	5:05	1:32:59	1:27:54

OPEN BOATS. Course, 10 Miles

Rose, H. Macht, Wissinoming	18:24	1:33:28	1:15:04
Peggie, A. C. Steel, Wissinoming ..	Scr.	1:17:36	1:17:36

THE DELAWARE RIVER "CHANCE RACE"

The "Chance Race" of the Delaware River Yachtsmen's League, held from the Columbia Y. C. of Bridesburg to the Trenton Y. C., in which seventeen boats competed, proved to be a success, not alone in racing qualities but also in the ideas formulated by the regatta committee. The competition was out of the ordinary run of things, in which each of the seventeen boats started out together for the run upriver and were not given time allowances by the regatta committee.

Where the feature of the regatta came in was, the owner of each boat had as many chances to draw for the prizes as the number of boats his craft defeated. The race tested the speed qualities of the fleet and demonstrated just where each boat stood in regard to time allowances and racing. The true qualities of the boats were shown and there was no chance for the owner of a boat to jockey or to slow down in order to make the race interesting. Each owner got as much speed as possible out of his boat.

Even the winning of the race did not assure the owner who obtained more chances by doing so, to carry off the prize. For the winner of the cruiser race did not have the lucky number in his eight chances while the owner of the second boat which finished was fortunate to have the lucky number in his seven chances.

The summary of the race-meet is as follows:

CRUISERS. Start, 2:55 P. M.

Boat, Owner and Club	Finish H. M. S.	El. Time H. M. S.
Deceiver, C. P. Bond, Farragut.....	5:27:43	2:32:4
Mascot, Chas. Heiber, Columbia	5:42:39	2:47:3
Helen T., C. Townsend, Wissinoming..	5:46:05	2:51:0
Jennie S., George Stock, Wissinoming..	6:03:34	3:08:3
Hattie Bert, H. Brightley, Farragut....	6:05:39	3:10:3
Wanderer, L. Frederick, Wissinoming..	6:10:40	3:15:4
Mazeppa, Phillips, Columbia	6:16:51	3:21:5

GLASS CABIN BOATS

Nymphea, Edw. Thornley, Trenton	5:55:18	3:00:1
We Du, Elmer Rainey, Farragut	6:14:09	3:19:0
Lillian II, E. J. Crosby, Camden..	6:17:09	3:22:0
Hannah II, Wm. Schroeder, Farragut..	6:17:18	3:22:1
Edalvi, Geo. Wilkinson, Trenton.....	6:27:13	3:32:0
Loretta, Lane & Dreifus, Wissinoming.	7:17:32	4:22:3

OPEN BOATS

Peggy, A. C. Steel, Wissinoming	5:45:50	2:50:5
Rose, Herman Macht, Wissinoming ...	6:05:50	3:10:5

du Pont Trophy Race

Dora II, owned by Bruno Aireshoff, Riverside Y. C won premier honors in the sixth annual competition fo cruisers for the du Pont Trophy, held on Saturday September 15th, under the auspices of the Delawar River Y. R. A. The Riverside organization won th trophy a year ago when Naomi, owned by Willian McNamee, led the field home by a good margin. Becaus of engine trouble she was hopelessly out of this season' contest, finishing in tenth position.

But for engine trouble, which delayed her mor than six minutes, the Pickaninny, owned by Bell an Taylor, Camden M. B. C., would have scored her thir victory of the season. She finished in second positio and captured third time prize. She gave a good ac count of herself and, outside of the small loss of tim due to the breakdown which occurred an hour after th start, moved along in a consistent manner. She wa the third boat home and for a time it looked as if "Pick would be the winner. She had to allow the Dora II trifle more than 70 minutes in the long run. When Dor II's time was about up she finally hove to out of th mist a few miles downstream, coming up strong. Sh was the next to last of the dozen boats competing t finish.

Helma, owned by William Fredericks, United B. C of Wilmington, which has shown some remarkable per formances in the last two years, again led the fleet home making the best elapsed time, covering the distance in hours 36 minutes 41 seconds. She was given a grea tussle by Lu Lu, owned by H. Morris of the same club beating her across the line by 5 minutes 20 seconds.

The summary is as follows:

Boat, Owner and Club	Allow'ce H. M. S.	Elapsed Time H. M. S.	Corr'te Time H. M.
Dora II, B. Aireshoff, Riverside....	2:08:45	7:22:03	5:13:1
Pickaninny, Bell and Taylor, Camden	58:35	6:14:45	5:16:1
Helma, W. Fredericks, United.....	18:23	5:36:42	5:18:1
Lu Lu, H. Morris, United.....	15:53	5:42:02	5:26:0
Mascot, C. Heiber, Columbia.....	50:16	6:27:47	5:37:3
Helen T., C. Townsend, Wissinoming	1:08:32	6:47:25	5:38:5
Jennie S., S. Campbell, Wissinoming	1:01:49	6:44:20	5:42:3
Margaret, W. Yeo, Camden.....	58:33	6:43:43	5:45:0
Charlotte, E. Clements, Riverside..	53:18	6:40:56	5:47:3
Naomi, W. McNamee, Riverside....	2:01:10	8:01:00	5:50:3
Eva Dor, A. R. Robbins, Riverside..	33:35	6:43:37	6:10:0
Lex, H. F. Eastburn, United.....	17:32	6:35:05	6:17:3
Waukesha, C. R. Bell, Camden....	Scr.	Dis.	Out.

Ship-Building

THE United States Shipping Board at the end of August announced that nearly 3,000,000 tons of shipping had been contracted for and that 1,281,000 tons more were under negotiation. The total amount of appropriations already granted and now asked for is close to two billion dollars. With this money vessels contracted for will be paid, others building in yards throughout the country which have been commandeered will be purchased, and yards will be established for the building of steel vessels by standardized methods of fabrication.

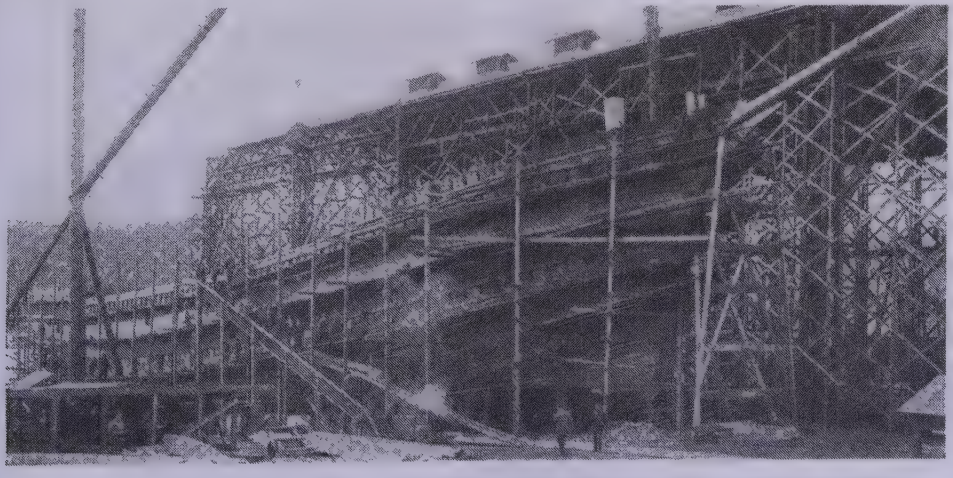
After nearly six months of delay the U. S. Emergency Fund Corporation has finally signed contracts for the establishment of three yards and the building of steel vessels. Two yards are to be established on the Delaware River and one on Newark Bay.

The American International Company will erect a plant at Hog Island on the Delaware which will cost $20,000,000; the Merchant Shipbuilding Corporation recently purchased a plant at Bristol, Pa., which will be enlarged, and the Submarine Boat Corporation will have a plant on Newark Bay just opposite Bayonne. These three plants will be owned by the Government and the companies operating them will act as agents and be paid in fees for their work.

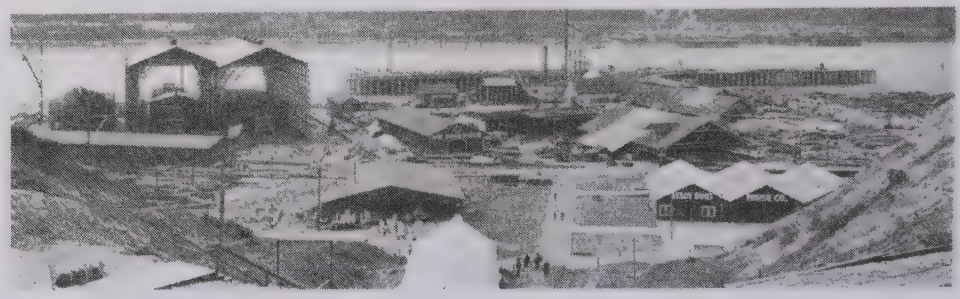
At present contracts have been made for building one hundred and forty vessels, but with additional appropriations by Congress this number will be increased to six hundred and perhaps many more.

The Submarine Boat Corporation closed its contracts on September 14th. It had already perfected its plans and is in a position to rush the work through. Henry R. Sutphen, Vice-President of the Submarine Boat Corporation, was the first to appreciate that cargo-carriers up to a certain size could be built by standardized methods of fabrication and turned out in large quantities. He laid his plans before Major-General Goethals, who was then the head of the Emergency Fund Corporation, many months ago and the General at once gave the plans his approval and authorized the Submarine Boat Corporation to go ahead with its plans. The site secured on Newark Bay was that of the Port Newark Terminal. It covers 125 acres, has a water frontage of 3,000 feet, with 28 feet of water at the end of the docks. Unfortunately for the shipbuilding program, Chairman Denman of the Shipping Board could see nothing but wooden ships and the steel program was held up. Now that Admiral Capps has succeeded General Goethals the plans have been put into execution and the work will start at once.

The Submarine Boat Corporation will have twenty-eight sets of ways on its plant capable of building vessels much larger than those contracted for. The foundations for the shops have been laid and the material for the erection of the shops is now being assembled. The keels of the first vessels will be laid in December. The first launchings will be in March, and when the work has been speeded up one vessel will be launched every two days. These vessels are of 5,000 tons each. They are to be 350 feet long, 46 feet breadth, 27 feet depth moulded, and will be driven by Westinghouse reduction gear turbine engines of 1,500 h.p. Steam will be generated in Babcock & Wilcox tubular boilers and oil will be used for fuel. The speed of these vessels will be 10.5 knots. The plans for these vessels have been approved by Lloyd's and the American Bureau of Shipping. The steel mills already have the patterns and moulds and the many parts will be turned out in quanti-



A 255-Foot Auxiliary Schooner, Building at Portland, Ore., From Designs by Tams, Lemoine & Crane. One of a Fleet Nearing Completion



Peninsula Shipbuilding Company's Plant at Portland, Ore., Where Many Wooden Cargo-Carriers Are Being Built

ties, shipped to the Newark plant and erected there. The new plant will give employment to twelve thousand men.

The American International Company was organized at the outbreak of the war to exploit American business and it has the backing of capitalists interested in the National City Bank and other wealthy institutions. It secured a site at Hog Island on the Delaware. The plant there will cost $20,000,000. Fifty vessels are to be built and completed in eleven months.

The Merchant Shipbuilding Corporation is financed by W. Averill Harriman. Mr. Harriman purchased the Chester Shipbuilding Company some months ago and this, with a new plant to be erected at Bristol, Pa., has been turned over to the new company. At the Chester yard there are now ten ways. The Bristol yard has yet to be built. Twenty-eight vessels are to be built at Chester and forty at Bristol. The shops at Bristol are to be erected by the American Bridge Company and the piling and concrete work is to be done by John Monks & Sons.

The seriousness of the long delay in making these contracts is now being appreciated. Had the work been started last April or May, the plants would now be in working order and the ships would be in some instances nearing completion. Those who planned the work had figured on two Summers and one Winter. The delay has changed this and it will extend over two Winters and one Summer. Where piling and concrete work has to be done there will be more delays. It will take six weeks or two months to get the piling and that will mean November before any concrete can be used. If the Winter is an open one this will not matter, but concrete cannot be worked in frost and should the Winter be severe the concrete work will have to wait until Spring.

In the meantime wooden vessels are being built all over the country. On the Pacific Coast the old shipbuilding plants are very busy and new companies are constantly being formed. Naval architects are rushed with work, and nearly all those who paid most attention to yacht designing are now devoting their time to the building of merchant vessels, and they are all doing fine work.

Portland, Ore., is growing very fast as a shipbuilding center and is now probably the busiest city on the Pacific Coast. It has in operation several yards where wooden vessels are being built, two steel plants and now other yards are being planned. The Oregonians are firm believers in Douglas fir, because they are firmly convinced that it is the very best timber that can be procured for the building of vessels and because the enormous size of the pine trees enables the mills to cut the timber into long lengths for ship-building. There is such a demand now for ships that builders in all parts of the world are trying to secure pine from the forests of Oregon, and only a little while ago a new schooner started on a voyage to China with lumber. This vessel was built by the Peninsula Shipbuilding Company from designs by Tams, Lemoine & Crane, and is the first of many vessels which that firm has designed, some of which are being built for private interests and others for the U. S. Shipping Board.



Cargo-Carriers Building at the Peninsula Shipbuilding Plant at Portland, Ore., From Designs by Tams, Lemoine & Crane, For U. S. Shipping Board

The Peninsula Shipping Company is the largest wooden plant on the Pacific Coast now in operation. It has in its plant a dock 1,100 feet long and 125 feet wide. This is the largest dock in the Northwest. It is equipped with two standard gauge tracks and connects directly with the Union Pacific Railroad. From its piers there is 30 feet of water all the way out to the ocean. Another great advantage this company has is that its yards adjoin the Peninsula Lumber Company, with which it is closely allied, F. C. Knapp being president of both companies.

Charles King, of the firm of Tams, Lemoine & Crane, has recently returned from Portland, where he spent six weeks inspecting the yards of the Northwest, and he is enthusiastic about the possibilities for ship-building and the great boom that has only really started. Mr. King believes that an era of great prosperity is soon to sweep over this country and that the shipping interests will benefit perhaps more than any other.

At the Peninsula Company's yards there are building four schooners from Tams, Lemoine & Crane designs and several vessels for the Shipping Board. The schooners are 255 feet long over all, 240 feet on the waterline, 43 feet breadth, 19 feet draught, and 2,000 tons deadweight. They are auxiliary schooners, driven by two six-cylinder Winton-Diesel engines of 340 h.p. each, which turn twin screws and will give the vessels a speed of 8.5 knots. One of these auxiliary schooners has been finished. It is named Esperanze. Alex Winton and Chief Engineer Salisbury of the Winton Company watched the trial trip of this vessel under power, and everyone was well pleased with the way the engines worked and the manner in which the schooner handled. This is the vessel now on its way to China.

In addition to the schooners, the Peninsula Company is building several vessels for the U. S. Emergency Fleet Corporation, which are also from designs by Tams, Lemoine & Crane. These vessels are of 5,000 tonnage and they are to be equipped with Westinghouse geared-down turbine engines of 1,500 h.p. each. These turbines are rapidly nearing completion and will be ready in time for the ships when they are launched. I. A. Colley, of the designers' firm, recently visited Pittsburgh to inspect the work and reported that the thirteen engines building are progressing fast. The Westinghouse Company is turning out these engines, which are to be used in nearly all the vessels building for the Emergency Fleet Corporation, very rapidly and has so much work on hand that a new plant is to be started at once at Essington on the Dalaware.

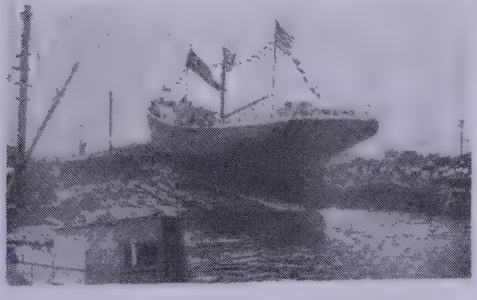
For wooden vessels the West has outstripped the East. The facilities for obtaining the lumber and for cutting it into the required lengths are better there than in Maine or Georgia, and if Longfellow were living today he would have to rewrite the "Building of the Ship," in which was used "cedar of Maine and Georgia pine."

According to Government reports there are now standing in the Western timbered area of the States of Oregon and Washington about 450,000,000,000 feet of Douglas fir (Oregon pine) trees. These trees grow to such an unusual size, commonly 3 to 5 feet in diameter and 175 to 250 feet high, that shipyards can obtain on short notice huge sticks at comparatively low cost.

The keels of the vessels in the Peninsula yard are 25 inches by 24 inches by 120 feet. These dimensions give some idea of the possibilities of ship-building on the Pacific Coast. A glance at the pictures herewith will show the size of the frames and then with all this heavy timber the planking is steel-strapped, so that the new vessels promise to rival in length of service many of the present existing vessels built of Douglas fir. There are many on the register varying in age from ten to thirty-eight years and they are still staunch.

The stumps of the trees cut to furnish the lumber yield the finest and largest knees in the world. As many as three hundred of these knees are used in a single vessel. Most have an angle of 90°, although a few are used for special purposes that require angles greater or less than this. Stumps on level ground yield knees having right angles, while roots of those trees on a hill produce knees with acute angles on the uphill side and obtuse angles on the downhill side.

The modern way of building a vessel would be a revelation to the old builders of last century. Machinery has taken the place of manual power. Where the adz was formerly the tool of the man who fashioned the timbers to their smooth, harmonious form, the band-saw is now used. These band-saws are great whirling, spinning wheels around which the supple ribbon of steel constantly runs. They can be turned at any angle and cut through huge timbers shaping them to the form of the ship's hull. This is done in sheds nearby where the hulls are rising from the ground. A pattern is laid on the timber and the saw cuts to this pattern, the sawyer watching the marks and tilting the saw to take any curved line required.



Schooner G. A. Somerville, Designed by Cox & Stevens. Ready For Launching



Schooner G. A. Somerville Afloat
(Plans of This Schooner Are Printed on Page 671)

About three hundred men are at work in the Peninsula yard shaping the timbers. Their strength is no longer used to do the lifting, boring and hammering, but is husbanded like any other resource which must be conserved. Wherever a machine may do the work of one or ten men the machine for the job is devised. The timbers are drilled for the steel pins which fasten together block on block or plank to frame. Not many years ago this was done by man-power and the process was slow and toilsome. Now electric or pneumatic drills do the work, and the bolt or rivet is put in with a hammer worked by air. Finally when each plank is in its place and the outside surface is to be smoothed and made ready for the painter, even the old-fashioned plane no longer plays a part. In its stead again the whir of an electric engine is heard and a shower of finely chopped shavings follows the swiftly moving hands of the carpenter, who guides a steel device that again takes the place of many men.

This shipbuilding company is now using in its work pieces of lumber that could not be duplicated for ship construction in any other part of the country. The keels are 120 feet long. Frames are fashioned from pieces 12 inches thick by 46 inches long. Here are some of the sizes: ceiling from floor to clamps, 55 feet; clamps, 60 feet; planking, bottom and bilges, average 45 feet, and above the bilges to the deck, 55 feet. The planking is from 12 inches to 5 inches thick. The waterways are 60 feet in length.

A Bargain Sale of Yachts

By W. P. Stephens

HOW many yachtsmen of today can recall the "Morgue," on the South Brooklyn shore, where we went in early Springtime with very little cash but much hope and enthusiasm to purchase a "yacht"? The proprietor of this institution was one Frank Bates, an old-time sandbag sailor and a builder in a small way of centerboard catboats and sloops, also a dispenser of liquid and solid refreshment to the thirsty and hungry yachtsman. For some years during the seventies and early eighties the "Morgue" was located at the foot of 37th Street, South Brooklyn, but I am under the impression that at a still earlier date it was located somewhere near the "Foot-er-Court-Street," that corner of Gowanus Bay about the mouth of Gowanus Creek, then a wide expanse of shoal flats useless for commercial purposes and abandoned to the yachts of New York and Brooklyn. As practically all were shoal centerboard boats, even the largest found a snug harbor here, the birthplace and cradle of both the Brooklyn and Atlantic yacht clubs and the home of "Hen" Smedley and his famous "Penny Bridge" boats, renowned among the fast sandbaggers of the time. A small yacht club, the Long Island, of which Frank Bates was treasurer, made its quarters at his place. The beach was ornamented with all varieties of ancient and dilapidated boats and yachts, most of them to all appearances past all further use, but destined to float again perhaps with occasional intervals of submergence, under the ownership of confiding but ignorant tyros buying experience with their first yacht.

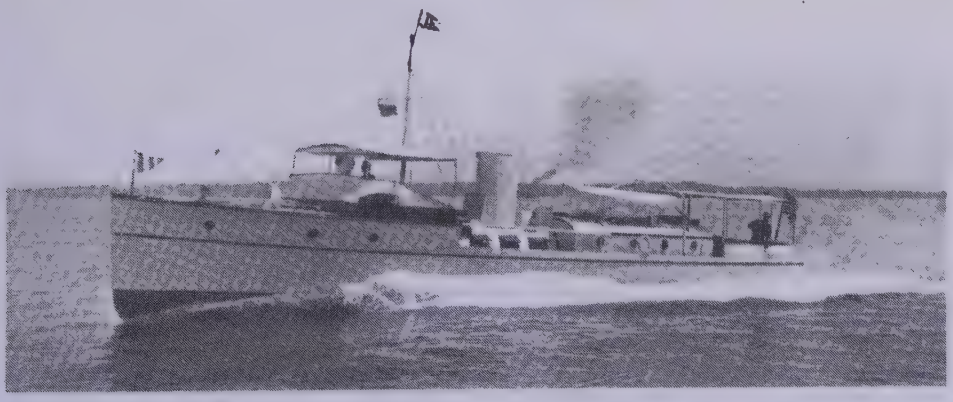
A memory of this ancient institution came back to me one day at the end of August as I found my way to Ulmer Park Basin on Gravesend Bay in answer to an advertisement of an auction sale of yachts. This basin, established about twenty years ago by A. Perry Bliven, if my memory is correct, has very fair facilities for repairs and laying-up, but has never been a commercial success; it has just been taken over by the Government, presumably as a station for the smaller craft of the coast defense fleet, and all yachts were ordered out by September 1st. While some of the larger steam yachts, Wakiva, Nirvana and others of this class, have used the Basin regularly for years, it has also become the final resting place of many old craft whose blackened spars, frayed and weatherworn rigging and gaping seams carry one back to the "Morgue" of other days. Close by the gate is all that is left of the cutter Rajah, designed by Cary Smith for James G. Beecher, of New Haven, and built at Pottery Beach by Johnny Driscoll in 1884. For many years she was well known about the Sound under the ownership of Henry W. Eaton and Walter C. Hubbard. Beside her was the little yawl Windward, which I designed and built in the same year for Hugh L. Willoughby, then a keen sailor of yachts and canoes, but now all up in the air over flying machines. In the same sad group are two Burgess boats, the famous 40-footer Gossoon and the 30-footer Fancy, later Elver II.

The buying of seaworthy and still serviceable yachts for the removing of their lead keels has developed into an established business within the past dozen years; while many yachts have reached this final stage as the ending of a long and honorable career, perhaps the majority have been modern craft, such as the steel schooners Muriel, Elmina I and Tekla, all designed by A. Cary Smith, by no means extreme in type or dimensions, and not over fifteen years old. Well underway before the outbreak of the war, this unwholesome development of yachting has grown rapidly with the great increase in the price of metals, lead, copper and brass, and as conditions are at the present time there is no saying where it will end. The leader in the business is C. D. Vail, of Wreck Lead, Long Island, who has owned more yachts than any other man in the history of the sport.

As soon as a yacht is purchased by Mr. Vail, her sails, spars, rigging, ground tackle, and usually the plumbing as well, are removed, with cushions, bedding and such other fittings as may be included in the inventory. These are disposed of as occasion serves and the hull is towed to a convenient yard, where it is hauled out, the keel is cut with an acetylene torch into pieces of manageable size, the keel bolts backed out, and the holes in the wood keel plugged, after which operations

the hull is launched and tied up ready for sale. A few years ago much of this work was done at the old yard of the Marine Construction and Dry Dock Company, at Mariners Harbor, Staten Island, but at the present time most of it is done at the Ulmer Park Basin. As Mr. Vail has a contract with the Government for furnishing many tons of lead, the supply of the bare hulls greatly exceeds the very limited demand, the modern type of racing yacht being of very little use for conversion to fishing or other practical purposes. It was planned to sell a number of hulls at auction, but the taking over of the Basin made this necessary on very short notice, and as the sale was inadequately advertised the attendance was limited largely to a small assemblage of fishermen and a few yacht skippers and others attracted out of curiosity. Tied up to the center pier of the Basin was the auxiliary yawl Scotia, better known by her original name of Sieglinde, designed by Gielow and built by Jacob in 1906; 94 feet 6 inches over all and 64 feet 8 inches water-line. This fine cruiser, with a 45-h.p. engine new in 1915, was sold last Spring for junk; the lead and gear have been removed and the hull was recently sold to be used for freight and passenger service in South America.

The first yacht put up at auction was the cutter Aspirant, designed by Gardner and built by Wood in 1903 for Messrs. Hanan; 64 feet over all and a first-class racing boat in her day. Starting with a bid of $150 she was very shortly knocked down for $250. Gamecock, 46 feet 6 inches over all, one of the Herreshoff Buzzards Bay Class of fifteen yachts built in 1902, was started at $100 and knocked down for $150. Eleanora, formerly Effort I, another Herreshoff boat, 58 feet over all, built in 1901, found no bidders, but toward the end of the sale she was put up again and withdrawn after one bid of $100. Paladin, the 68-foot ketch designed by A. Cary Smith and built in 1899 by Poillon for Mr. Walter C. Hubbard, a fine cruising yacht handsomely fitted below, was started at $250 and finally knocked down for $550; to be used for some commercial purpose. Pawnee, the Gielow yawl, 53 feet over all, built by Byles in 1896, was sold on the first bid of $100. A 10-h.p. single-cylinder engine, started at $10, finally brought $25. A very nice mahogany dinghy, with engine, started at $10, aroused the languid interest of the crowd and finally went to a lady at $80; another well-worn lapstrake dinghy with a Waterman engine, the outfit showing much wear and tear, was started at $25 and ran up to $65, a poor bargain for someone. A small open launch with no engine was started at $20 and went for $40; and a pretty good lapstrake boat about 16 feet long started at $15 and went at $20. One of the old Herreshoff fin-keel thirties, offered under the name of Iowa, brought no bids, and the same fate befell the hulls of Wild Olive, originally the Gardner Mira, built by Wood in 1889; and the Herreshoff Joker, of the 31-foot Bar Harbor Class, built in 1903. Sirona, the Lawley cutter, 50 feet over all, built in 1899, was started at $100 and sold for $250. A 35-foot glass-cabin launch, Wequetecock, with a specially built four-cycle engine, was started at $300 and run up to $450. The old Elsworth-Prague Anaconda, of 53 feet water-line, one of several yachts built to beat the famous Fife Clara, was started at $150 and finally sold for $500; she has been in fishing service for the past ten years, with auxiliary power, and though in her thirtieth year she is likely to weather out several more seasons in similar work. An assortment of gear, including ground tackle, cabin cushions, bedding, etc., was laid out for sale on the deck of Sieglinde, but the first lot offered, six mattresses, brought no bid, and the sale was stopped. On the whole it was a melancholy proceeding, conducing to serious meditation on the future of yachting under canvas.



Inquirer, Colonel James Elverson, Owner; Length 62 Ft., Breadth 11 Ft. 6 In., Draught 3 Ft. 9 In., Built by Mathis Yacht Building Company, From Designs by A. Loring Swasey. Equipped With Two 8-Cyl. Patrol Model Duesenberg Engines of 280-300 H.P. Each, Which Turn 28 by 28-In. Columbian Wheels 1,225 R.P.M.; Speed 25 M.P.H.

Making Landfall

By Grafton B. Fish

"FLASHING white light one point on the port bow!" shouts a voice from aloft in the darkness. And standing beside the Commander I heard him give a big sigh of relief, for he had made his landfall. Landfall means to see land again, or at least something made fast to the earth, a lightship or a buoy, but better a headland or lighthouse. For days you have known, or think you have known, within a few miles your position on the earth's surface, but now that you are making the land that few miles of doubt may be enough to pile your ship upon some outlying shoal or reef. If it is thick, your danger is greater, for the only warning you will get is the blast of a horn or the quick shoaling of water which may come too late.

I remember well one wild winter night creeping in at half-speed through a blinding snowstorm, trying to make a light on the South coast of Ireland. We were feeling our way along the 40-fathom curve hoping for the gleam of a friendly light through the rifts of the storm. The Commander had been on the bridge for twenty hours and was wearily hanging on to a stanchion, peering shoreward. Standing beside him I heard him mumbling softly to himself: "God! if I could only see something!"

To see—is the sailor's prayer. Wet, cold, gales—all in a day's work; but fog and snow are his enemies. They rob him of his sight.

We will be on soundings next watch so will start preparations.

Rig out sounding machines; oil bearings and run out ten or twenty fathoms of wire to limber up the machine; have arming and tubes ready.

Prepare a sounding board by tacking a sheet of white paper on to a light stiff board. Rule off squares large enough to hold the arming from each cast and note, in the corner, the time, log reading and depth of each cast.

Have a deep-sea lead ready in case your sounding machines jack up.

On your coast chart lay off your position and draw a light line on the true course the vessel is making. Note carefully all soundings along this line, lights visible, dangers near, day marks, or any aid or danger to the navigation of the ship. Look up characteristics of lights; and it is a good plan to note them on sheet in the order they are picked up, distances off and distances between them.

Get sights as late as possible, but beware of errors due to shoal water, currents, or atmospheric conditions which prevail near a coast. Don't rely too implicitly upon sights taken under doubtful conditions.

When to begin soundings will be determined by the character of the coast and gradient of the continental shelf off the coast. The draught of ship and the weather also govern the time to start.

Large steamers making the coast between Nantucket and New York generally get a cast near the 50-fathom curve. If it is a clear night, it is perfectly safe to stand in, as you will be sure of seeing a light long before you would hit anything. If East of Nantucket and you shoal to water to 26 fathoms, haul to the Southward until you get that depth again, then stand in.

From your log reading lay off the distance runs between your plotted position and your cast. Mark that position on the course by a small circle. Look around in the vicinity and find a sounding that agrees with the cast just obtained. If there are several, take the one nearest the dead reckoning position. In half an hour take another cast and lay off position on the course. Compare the sounding at that point with cast. If these agree you may fairly assume your D. R. position is right, but don't be too sure.

As soon as you get a third cast, after a time interval long enough to change the depth of water, take a strip of stiff paper and lay off on its edge the distances between casts; then mark the soundings with their time and depth. With the edge always parallel to the true course of the steamer, move the paper around in the vicinity of the D. R. positions of the casts until you find a place that the soundings agree with the depths obtained with the lead. As each new cast is taken, put it on the paper at the right distance from the last cast, and repeat the process.

If these continue to agree as new casts are taken, you are safe in assuming that your D. R. position is approximately right, but do not neglect any possible check because of their agreeing.

The P. & O. liner Delhi was lost on Cape Spartel a few years ago because of the commander's overconfidence in his position. He was running in a light fog and, after taking two casts which agreed with his D. R. positions, he assumed he was correct and stopped his lead. In less than an hour he piled up on the rocks inside the Cape.

If there is a spur of a bank on the course, you can check up by sounding when near the edge and when leaving the other edge. This same check may be used if there is a deep hole on the course. In thick weather determine a depth of water that will keep you clear of all dangers and do not get into less water than that depth. You can work around a point by keeping on a curve of soundings. For instance, if you keep in 50 fathoms, you can safely round Tuskar Light and stand on up the Irish Sea.

Keep a sharp lookout aloft and below for lights or land, and as soon as anything is sighted note bearing, time and log reading, check the light by timing the flash and interval. If you make a light on the horizon, your distance off, in clear weather, will be approximately the range of visibility of the light. As soon as possible determine distance off light by a four-point or any two bearings.

In making a rockbound coast, such as Halifax Harbor, in thick weather, if you shoal your water to the danger curve before seeing anything, stand off immediately into deeper water on the same course you stood in. If necessary anchor until the weather clears, if this is safe; if not, stand offshore until it does. In any

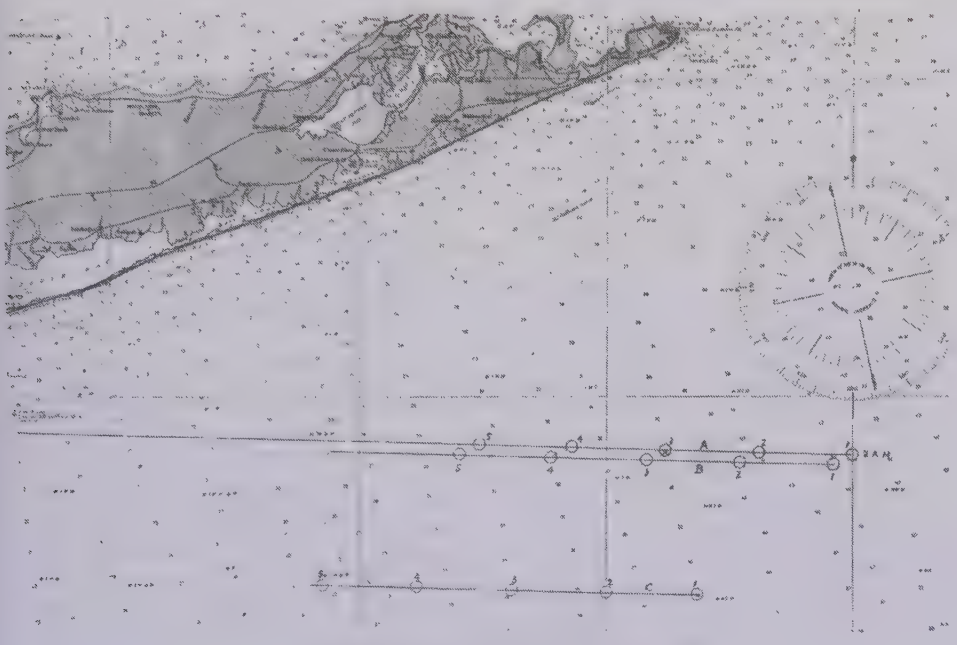


Chart Showing How Soundings Fitted Three Courses

case do not stand inside of the danger curve on soundings alone.

Of course the actual methods used must vary with the conditions, and this article can only deal with the general routine employed in making a landfall.

Above all, don't be overconfident of your position, use every possible aid to check your position and in thick weather keep outside your danger curve.

A few hints about sounding with the patent sounding machines:

Don't release brakes too far, just enough so that the wheel runs freely.

Bear on the wire very lightly with the feeler. Your wire will slack down as soon as you get bottom.

Don't let wire overrun when the lead is down and don't bring up brake with a jerk but with a quick, steady pull.

Be sure to keep tube vertical all the time in taking aboard or the water may run up on one side and spoil the cut.

Your arming should be packed in hard and flush with the bottom of the lead.

On a recent voyage of a steamship, the coast was made in hazy weather under the following circumstances: The position at 2 a. m. was 40° 24½′ N., 71° 30′ W. D. R. from previous noon sights; variable currents and thick weather till midnight; hazy weather until dawn. As these circumstances are the same as might be met by a patrol boat making New York, they are given with a hope that they might interest yachtsmen who are in that service.

Position by D. R. at 2 a. m. 40° 24½′ N., 71° 30′ W. True Course, N. 88° W. to Fire Island Light-Vessel.

2:00 a. m. Cast of the lead, 43 fms.
2:30 a. m. " " " " 40 fms.
3:00 a. m. " " " " 38 fms. Lat. by Pole Star 40°22′ N.
3:30 a. m. " " " " 35 fms.
4:00 a. m. " " " " 31 fms. Lat. by Pole Star 40°10′ N.

At 4 a. m. sight horizon slightly better. Horizon hazy and not very reliable.

Latitude by either sight possible.

Referring to chart you will note the three courses laid off with their positions at the five casts. You will note that the series of soundings will fit on any of the three courses.

Position by D. R. was not very reliable. Variable currents and thick weather twenty-four hours previous. Deviation of compass not known accurately, as compass had been readjusted before leaving other side.

At 4 a. m. the ship is probably in one of the three positions marked No. 5. If she is South, the commander wants to haul up so as to make Fire Island Light-Vessel. What would you do?

A. D. R. Line.
B. First Pole Star Lat. line, 2:30 a. m. sight.
C. Second Pole Star Lat. line, 4:00 a. m. sight.

Navigation for Beginners

By Clarence W. de Linden

Lieutenant-Commander U. S. Naval Reserve

PART II

(Continued from August)

HAVING mastered the points and the degrees of the compass, do not imagine for an instant that this is all you have to know to be an efficient navigator. It is, however, a very essential and necessary step to the knowledge of the study of this important art.

As I remarked in my previous lesson, your compass is never a constant factor, but changes with nearly every angle of your vessel's head. The reason for this is as follows:

Magnetism is a name given the phenomenon displayed by magnets of attracting pieces of iron and steel. Magnets are of two kinds, natural and artificial; the ore commonly known as "lode stone" is a natural magnet. The chemical composition of this ore is about 72 parts of iron and 28 parts of oxygen. When a bar of iron or steel is rubbed with a piece of lode stone it will acquire magnetic properties similar to lode stone, without losing any of its own power of magnetism. Such bars or needles are termed artificial magnets.

Magnetic Poles.—When you plunge a bar of this magnetized iron into a box of iron filings, the bar does not become covered uniformly with the filings, but they will arrange themselves around the ends of the bar in feathery collections or tufts that decrease in quantity as the middle of the bar is approached, leaving the middle of the bar bare. The points around which the filings concentrate are termed the "poles" of magnetic forces, while the middle portion of the bar, which has no visible magnetic force, is called the "neutral zone".

Magnetic axis is a line connecting the two poles of a magnet.

Magnetic Polarity.—A magnetized needle suspended on its center of gravity will move itself in a definite direction; pointing toward North and South. This tendency, called polarity, applies to all magnets. The end pointing Northward is called the North-seeking, or red pole or positive end, and the other South-seeking, or blue pole or negative end. Or in other words, the North-seeking end of the bar or needle has red polarity while the South-seeking end has blue polarity.

Magnetic Attraction and Repulsion.—When two magnetized bars or needles are brought close together, the North end of the needle (or red end) will attract the South-seeking or "blue pole". From this we find the following law for magnetic attraction and repulsion: Poles of contrary names will attract each other, while poles of similar names will repel each other, or the red pole of one magnet will repel the red of another, but will attract the blue, and vice-versa.

Magnetic Property of the Earth.—The known fact that a suspended needle will take a fixed position is proof of the theory that the earth is itself a huge magnet having the red and blue magnetic poles near the geographical poles, and the magnetic needle turns to these poles as to the poles of an ordinary magnet, according to the foregoing law. As the North-seeking end of a needle has red polarity, it will be seen that the magnetic pole of the earth situated in the Northern hemisphere must be the blue pole, and the Southern end the red pole.

Magnetic Meridian is the direction that the horizontally suspended magnetic needle assumes when not influenced by local attraction.

Magnetic Components.—The magnetic force of the earth may be resolved into two components, one horizontal and one vertical. The first represents the horizontal directive element of the compass needle; the second acts only vertically. A magnetic needle mounted at its center of gravity would be acted on by both components.

Magnetic Dip is the effect of the vertical component of the earth's magnetic force, or the inclination, or downward deflection from the horizontal, of the magnetic needle free to move in a vertical plane. The amount of dip varies from 0° to 90°, being 0° at the magnetic equator and gradually increasing to 90° at the magnetic pole.

Magnetic Equator is a narrow belt or zone embracing all points on the earth's surface where the magnetic dip is 0°; it encircles the equatorial part of the earth and intersects it, but never recedes more than 16° on either side of the geographical equator.

Magnetic Induction is the property of a magnet to impart magnetism to a body of iron or steel in its immediate vicinity. Thus, the earth, being a magnet, will impart or communicate magnetism to the hull of an iron vessel. The vessel is then said to be magnetized by induction. Now is it any wonder that we have trouble with our compasses?

Magnetic Variation is the angle that the magnetic meridian makes with the geographical meridian; or, what is the same, the angle that the direction of the suspended needle makes with the true meridian. It is caused by the magnetic poles of the earth not coinciding with the geographical poles. Variation is not constant, but undergoes a progressive change, the annual amount of which is invariably marked on charts for different localities. There are also what we term "Isogonic" or Variation Charts. Agonic lines are curves or lines connecting all parts and places of the earth's surface where the variation of the compass is zero. Isoclinic lines are curves that are drawn intermediate to the poles and equator, connecting all places where the dip of the magnetic needle is the same.

I am very sorry that I am obliged to lead you in such a circle, or around-about way, to the subject in hand, but let me again impress upon you that you are studying one of the all-important parts of Nautical Art that means much to you, my dear "Sea-Dog". I will tell you later why; you will think I am not so bad after all, as we boys used to say about Admiral Dewey in my "Annapolis" days when we used to get a little extra work to do.

(To be Continued)

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART X

BEFORE a designer can begin to prepare a design, he must have some definite particulars to guide him. These particulars he either selects or they are supplied by the man for whom the design is being prepared. In this particular case, I will assume that an order for plans of a 36-foot cabin power boat has been placed and requirements have been stated in a letter, a copy of which I give below:

Dear Sir:

I want you to furnish me with plans and specifications from which a boatbuilder can build a satisfactory cabin cruiser. I desire an able, safe and seaworthy boat about 36 feet in length by 9 feet breadth to use on Long Island Sound.

I would like the boat to have accommodations in cabin for four persons and sufficient power to drive her at a cruising speed of not less than 10 miles an hour. The enclosed outline plan and some data of a very successful boat owned by a friend of mine will help to explain my ideas, but please remember that I want a full 6 feet headroom in cabin (the boat shown on drawing has only 5 feet 6 inches), and I do not want to have trunk cabin higher than one shown on drawing.

Yours truly,

The data referred to in letter is given in Part V, June issue, and I herewith reproduce the drawing.

This is a clearly stated designing problem and as the drawing and data are taken from a successful boat, you cannot do better than use it as a starting point and guide.

Before any designer can begin to prepare a design, it is absolutely necessary that he formulate in his mind ideas of form, size and general dimensions of the craft he intends to design. While it is proper and right to make use of data obtained from and observation of similar craft, it is very necessary that the real *idea* be original. To merely copy an existing design is not designing and can, at best, only result in producing a poor copy of some existing design.

Designing is really a recording of the designer's ideas. The designer places his ideas on paper, because by doing this he is able to check them carefully and record the complete data in such a manner that anyone can understand it and produce a finished article, if he has the ability to read plans and do the work. It is a mistake to imagine that designing is a substitute for any part of the production work, because it is not. It is merely a help, and it is wonderful how great a help real designing is.

The designing of boats is something that all boatbuilders should strive to learn; and it is something that

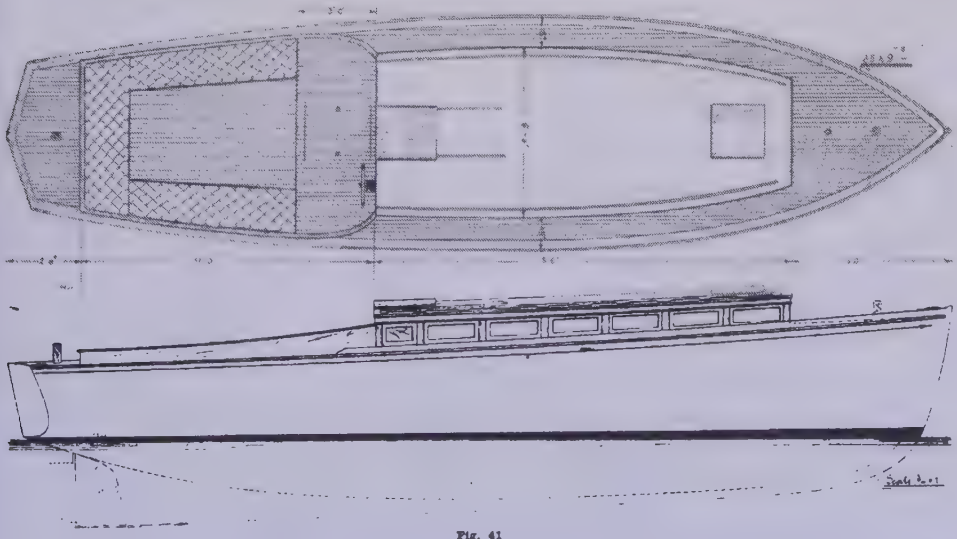


Fig. 41

can be learned quickly and accurately by anyone able to build boats. The art of building boats properly is a great deal more difficult to learn than the art of designing them.

During the whole time you are designing a boat, keep the general plan of the boat in your mind and strive continually to make the design illustrate *your* real ideas. Design for a purpose and do all that lies in your power to make each design the best you can produce.

Begin immediately to collect data for reference purposes. No designer can work without having at hand data of things that are used every day in boats and vessels. Get catalogs of marine engines, fittings and hardware, and look them over. Study the articles listed and learn to select the proper article and size for each boat you design and begin to prepare a book of data.

Such data as this will be found valuable for referring to:

Particulars of any boat you read about. As, for instance, the displacement, the power, the speed, costs, selling price; particulars of sizes of anchors, cables and fittings; data of propellers, particularly the diameter, pitch, slip, blade areas, etc.; and whenever you see any published data that might be valuable for reference purposes, cut the article out and paste it in a proper book.

The man that will do these things will find it much easier to design than the one who thinks that he can do without such aids.

In designing boats it is usual and customary to prepare the plans and specifications in certain standardized ways. The reason for this being that the plans and specifications can then be read by anyone having a knowledge of designing rules. Therefore, *always prepare your drawings in the accepted manner.* Stick to standardized methods.

To make sure that you clearly understand, I will here outline a few important rules.

Always prepare a preliminary drawing and calculations before you begin work on the real design. By doing this you will greatly shorten labor of designing, and you also obtain the benefit of seeing the relative proportions and general details of the boat before you begin designing.

The set of drawings should consist of these plans:

(A) The lines drawing. Show on it the profile, the water-lines, the buttock and diagonal lines and the cross-sections. The offset table can be on this drawing or on a separate sheet of paper.

(B) Show on your second sheet of drawing the keel construction details, framing and engine foundation details.

(C) Show on the third sheet of drawing deck framing, the flooring of boat, engine installation details and the general framing details of such things as seats, bulkheads, etc.

(D) Show on this drawing the interior and cross-section views.

(E) Show on this drawing the general views of the finished boat. If advisable to do so, have a separate drawing for rudder and steering gear details.

The specifications and list of materials can be separate from the drawings and should always be as complete as possible.

(F) The scale selected should always be as large as practicable because large scale drawings are certainly more accurate than small scale ones.

I will now assume that the designing idea has been formulated and that I am ready to make the preliminary calculations and drawing. In the June, July and August issues, I fully explained the way to make all necessary preliminary calculations, therefore, all that is necessary is to give the figures obtained by making the preliminary calculations and to show my ideas of forms by means of a preliminary drawing.

Of course I have used the data and general dimensions given by the customer as my starting point and working from this I have tried to produce a design for a boat having similar dimensions, but shaped in accordance with *my* ideas.

On Fig. 42 I show an illustration of the completed preliminary drawing.

Explaining the Preliminary Drawing

On this drawing I show, drawn to scale, my ideas of the shape boat should have, and on the drawing is marked locations of the principal center points, figures to denote weights of materials, and sufficient other data to enable me to prepare my lines drawing accurately by working from the preliminary one.

On the lower half of drawing is shown a profile view, and you will note that while dimensions are somewhat similar to the ones sent as a guide, the shape of profile is very different.

My outline shows a boat having a moderate raised cabin with a low trunk extending over a portion of it, thus the customer's desire to obtain 6 feet headroom without an excessively high trunk cabin is achieved.

The division of interior is outlined on drawing and on it I have also marked weights of various principal parts of construction, and as each set of figures is placed at the point where the center of gravity of the part weight is located both longitudinally or vertically, it is an easy matter to keep track of the various centers of weight. This is especially desirable should it become

Preliminary Construction Weight and Center of Gravity Calculation

	Longitudinally			Vertically		
Part No.	Weight of Part Lb.	Distance its C is from No. 1 Ord. Feet	Moment	Distance C is above L.W.L. Feet	Distance C is below L.W.L. Feet	Moment
1.....	900	19.6	17,640	...	1.00	*900
2.....	4,000	18.0	72,000	1.00	...	4,000
3.....	1,700	12.3	21,250	1.50	...	2,550
4.....	2,000	21.5	43,000	...	...	†
5.....	1,000	27.0	27,000	1.50	...	1,500
6.....	1,000	16.0	16,000	4.00	...	4,000
.....	400	28.0	11,200	1.50	...	600
.....	1,000	16.0	16,000	0.25	...	250
7.....	500	20.0	10,000	1.50	...	750
	12,500	Weight	234,090	Moment		
				Above Moment		13,650
				Deduct below Moment		900
				Total Moment above L.W.L		12,750

Therefore:

$\frac{234,090}{12,500} = 18.72$, the distance in feet the C.G. is aft of No. 1 ordinate.

$\frac{12,750}{12,500} = 1.02$, the distance in feet the C.G. is above the L.W.L.

* This is below the L.W.L., therefore, it must be entered in separate column and deducted from abovewater moments.

† This item's center point is estimated to be located at the L.W.L., therefore, no moment is entered, because the L.W.L. is the line from which we measure.

Note.—The weights entered here are the estimated weights of construction. The distance measures are the estimated measurements that centers of parts weights are from Ord. No. 1, or from the L.W.L.

necessary to change the C.G. point location before making the final calculations and drawings.

On the upper portion of drawing is shown the curve of areas, the outline of shapes of deck, of several principal water-lines and of cross-sections. The order in which the work shown on this drawing is done is as follows:

First—The profile and deck outline is drawn to conform with my ideas of form and dimensions and next the assumed L.W.L. position is marked, and both profile and deck outline views divided off into a sufficient and proper number of intervals for a Simpson's rule calculation. After the ordinate positions are marked, I divide up the interior longitudinally and determine the interior arrangement that I will have. Next I select the kind and dimensions of materials that I will use by referring to the tables printed in June issue, and after dividing the materials into parts I calculate construction weights and make the preliminary weight and C.G. calculation. The figures obtained by making this calculation will be found in table on preceding page.

The construction weights ascertained by making the preliminary calculation gives 12,500 lb as being the displacement required, therefore, it is necessary that the bulk of portion of boat below the marked L.W.L. be sufficient to displace 195 cubic feet of water, and as the preliminary C.G. calculation gives 18.72 feet as the distance C.G. point is aft of forward end of L.W.L., it is necessary to so shape the underwater bulk that C.B. point will be 18.72 feet from forward end of L.W.L. The next preliminary work is to select area of midship section. This is readily done in this instance by using for our preliminary calculation the midship section coefficient mentioned by customer (0.625) and determining required area by making the preliminary calculation already explained. This calculation tells me that the required area of section in square feet is 9.44.

Knowing this and the underwater bulk, and also the distance that center of underwater bulk (C.B.) must be from the forward end of L.W.L., the fore-and-aft distribution of bulk can be laid out.

The proper way to do this is to lay out a preliminary curve of areas, using the selected midship section area for diameter of generating circle. In this particular instance, I have selected the wave form for my preliminary curve and have laid out on the upper half of drawing the wave-form curve, which, as you will note, gives less than required volume, so it is necessary to increase the area enclosed by curve, and this I have done by filling in the hollows forward and aft. The filled-in portion of curve is indicated by cross lines.

I now know that if the immersed area of each ordinate section from bow to stern is made in accordance with measures taken at ordinate locations on curve, the boat's displacement will be exactly as required and center of this displacement (C.B.) will be exactly the same distance from bow that center of weight is. Therefore, providing my weight estimate is correct, the boat must float to the assumed load water-line. Below I give figures taken from my preliminary C.B. calculation.

Preliminary Displacement and C.B. Calculation for Cruiser (Fig. 42)

The preliminary calculation, made to determine the required displacement, gave 12,500 lb as the weights of construction, etc.

By using the coefficients decided upon (see Preliminary Data Sheet) I found that the midship section

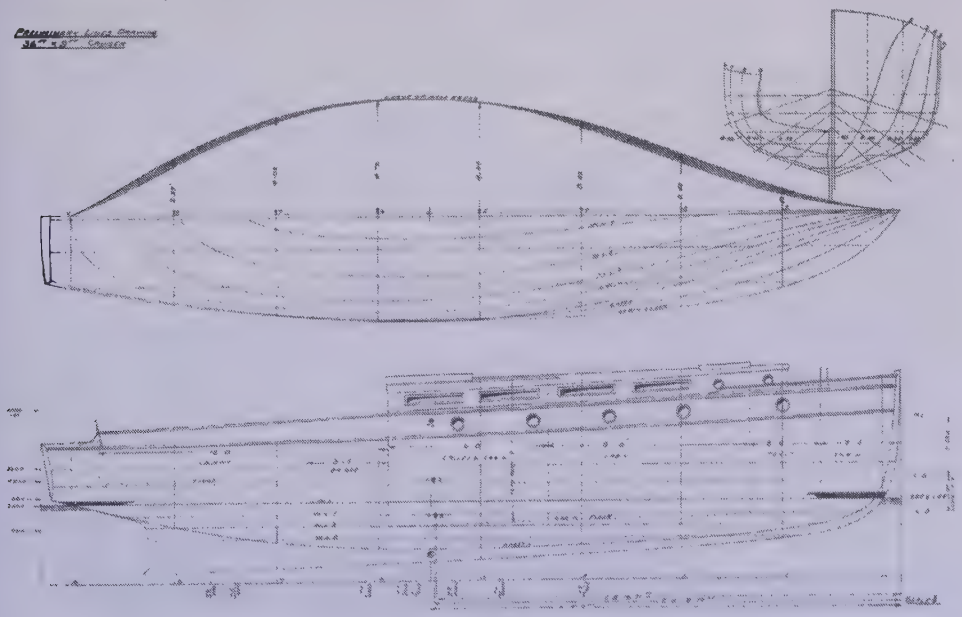


Fig. 42

should have an area of about 9.44 square feet and should be located about 19 feet from No. 1 ordinate.

Using the above figures a curve of sectional areas is laid out (see curve on Fig. 42) in the manner explained in previous article and the displacement and C.B. calculation is made in the manner shown below.

NOTE.—The curve of sectional areas shown was first laid out as a true wave-form curve. The displacement contained in the wave-form curve was found to be too small, therefore, I corrected the curve by advancing the forward points and moving the after points aft a sufficient distance to give the required additional displacement and at the same time bring the fore-and-aft location of the C.B. to the proper position (to correspond with fore-and-aft position of C.G. of weight).

The measurements entered below are taken from the curve of areas marked on the drawing. This curve is for *half* areas, therefore, the final figures are multiplied by 2.

Ord. No.	Area of Section	S X	Function of Areas	Moment X	Moment
1.....	0.00	1	0.00	0	0.00
2.....	0.83	4	3.32	1	3.32
3.....	2.42	2	4.84	2	9.68
4.....	3.85	4	15.40	3	46.20
5.....	4.64	2	9.28	4	37.12
6.....	4.72	4	18.88	5	94.40
7.....	4.02	2	8.04	6	48.24
8.....	2.33	4	9.32	7	65.24
			69.08		304.20
Interval is 4.25 feet				Interval	4.25
One-third interval is			1.417	Moment	1,292.8500
Volume of half areas.....			97.86 cubic feet		
Whole volume is			195.72 cubic feet		
Weight of salt water			64 lb		
Whole displacement			12,526 lb		

$$\frac{1,292.85}{69.08} = 18.71.$$

Therefore, the C.B. point is located 18.71 feet aft of No. 1 ordinate. This point is (almost) identical with C.G. point, therefore, if the fore-and-aft distribution of displacement is as shown by curve the C.B. will be correctly located *longitudinally*.

The next preliminary calculation is one to determine the approximate distance C.B. point is below L.W.L., and as the required area of L.W.L. plane is given on preliminary data sheet, I can quickly make this calculation by using the short formula already explained. Below I give complete figures of my calculation.

DETERMINING THE APPROXIMATE DISTANCE THE C.B. IS BELOW THE L.W.L.

In the early stages of the design the vertical position of the C.B. can be located very nearly by making use of the following formula:

$$\frac{1}{3}\left(\frac{d}{2} + \frac{V}{A}\right) = \text{Distance the C.B. point is below the L.W.L. plane.}$$

d standing for mean draught to rabbet in feet.
V standing for displacement in cubic feet.
A standing for area of L.W.L. in square feet.

For the Fig. 42 design the figures are as follows:

Volume of displacement is 195.72 cubic feet.
Area of L.W.L. plane is 194.58 square feet.
Mean draught* to rabbet is 1.185 feet

By using these figures in the manner explained above we find that the approximate position of the C.B. point is 0.532 feet below the L.W.L. plane.

$$\frac{1}{3}\left(\frac{1.185}{2} + \frac{195.72}{194.58}\right) = .5328$$

In boats and vessels of ordinary form it will be found that the approximate position will be between $\frac{8}{20}$ and $\frac{9}{20}$ of the mean draught below the L.W.L. plane; $\frac{9}{20}$ of 1.185 is .5332, which coincides almost exactly with the figures obtained from the formula calculation.

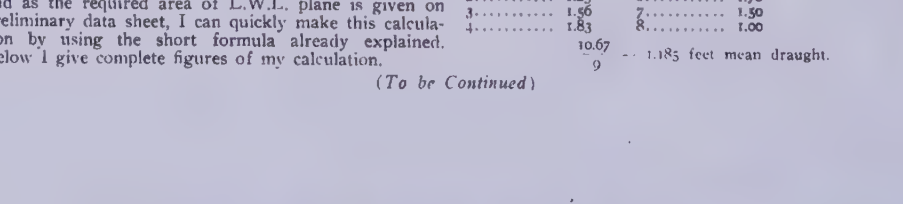
I next lay out the approximate shape of L.W.L. plane, being careful to get the area selected (194 square feet). The shape of this L.W.L. can be selected by first laying off a wave-line curve and correcting it, or it can be laid off by using one of several other methods that I will explain later. In this particular instance, I used the wave-line curve as a starting point and filled in the ends to bring the curve up to the required area and get a shape that will conform to my ideas.

*The mean draught to rabbet can be very accurately determined by measuring on your preliminary drawing the distance from L.W.L. to rabbet at each ordinate position and then finding the average. For the Fig. 42 design the figures are as follows:

Ord. No.	Measure	Ord. No.	Measure	Ord. No.	Measure
1.....	0.00	5.....	1.83	9.....	0.00
2.....	1.25	6.....	1.70		
3.....	1.56	7.....	1.50		10.67
4.....	1.83	8.....	1.00		

$\frac{10.67}{9}$ = 1.185 feet mean draught.

(To be Continued)



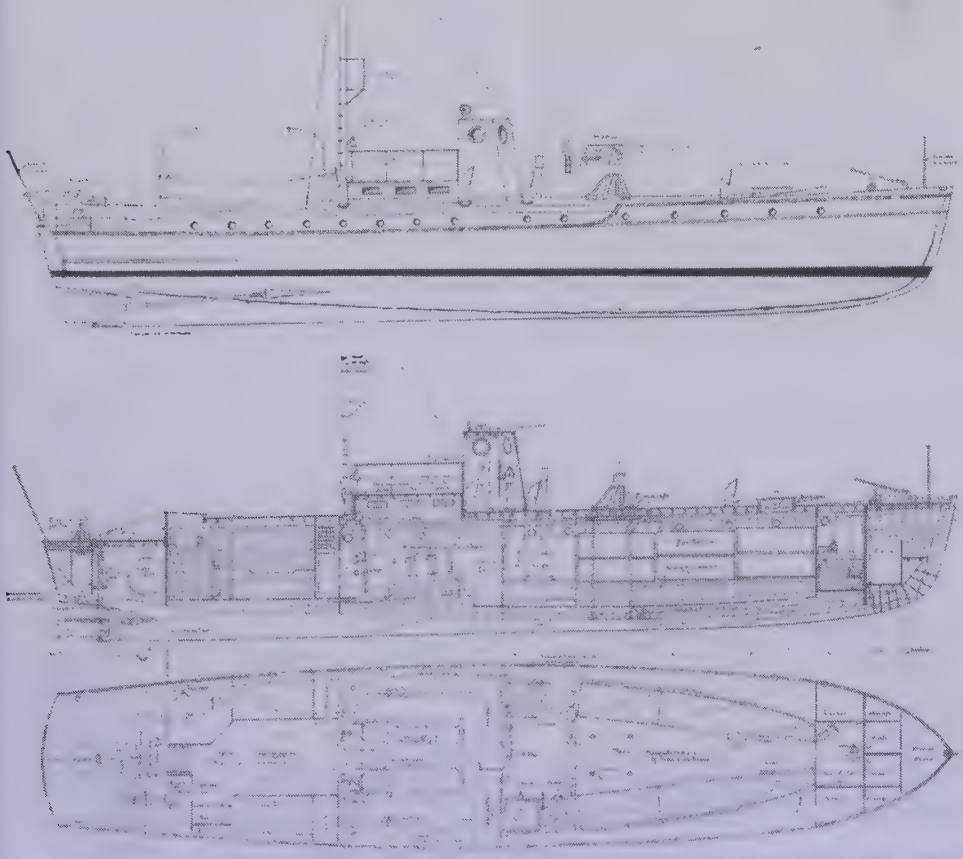
Designs

74-Foot Patrol Boat

A class of 74-foot patrol boats is being built by Clement A. Troth at Camden, N. J., from designs by J. Murray Watts, of Philadelphia. Two of these boats are now nearing completion. They are for George H. Earle, 3d, and Philip Wunderle, both of Philadelphia. The plans of these two vessels and wash drawings showing their general appearance are printed herewith. In general dimensions of the two boats are the same but their interior arrangements are very different. They are of the seagoing type approved by the Navy Department, having practically flush decks except for the navigating bridge and a small conning tower. A 3-pounder is fitted forward and a 1-pounder aft. In addition they also mount two machine guns amidships.

The vessel for George H. Earle, 3d, will have two Sterling engines of 200 h.p. installed amidships, and the engine space is separated from the rest of the room by watertight steel bulkheads. Besides the two main engines there is a 4-k.w. Universal electric lighting plant and a long range wireless outfit. The battery equipment consists of 56 Ironclad-Exide cells, giving 110 volts for the use of the wireless and the searchlight. Besides this outfit there is a separate electrical starting and lighting plant on each of the two engines.

The tank capacity of this boat is unusually large, there being tanks for 1,100 gallons of fuel, 96 gallons of lubricating oil and 700 gallons of fresh water. In the ammunition room there will be room to store 600 rounds for the 3-pounders and 6,000 rounds for the machine guns.



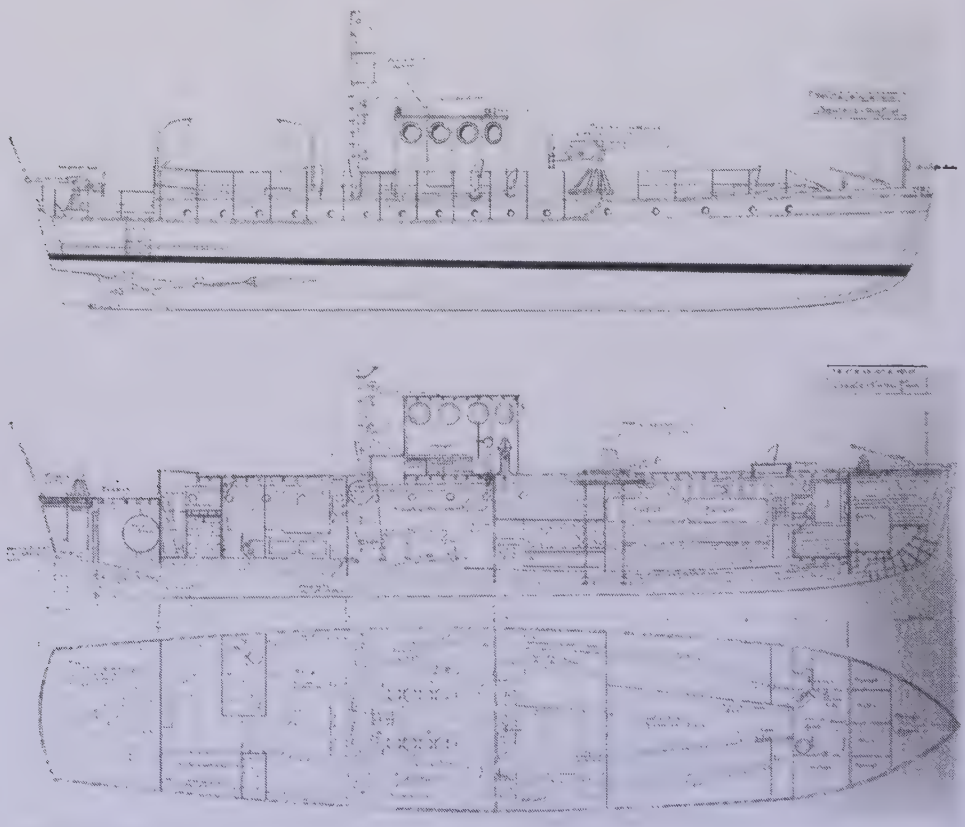
Profile and Arrangement Plans of 74-Foot Patrol Boat, Building For Philip Wunderle by C. A. Troth, From Designs by J. Murray Watts

Starting from the bow, below deck there is a fore-peak used for storage and chain lockers, all shut off from the rest of the boat by a watertight bulkhead. Then comes the crew's bathroom with shower bath, toilet, wash-basin and lockers. Next is the crew's quarters with berths for eight men, a mess table and hanging lockers. There is nearly 8 feet headroom in the living quarters. Aft of the crew's quarters is a stateroom on the port side, with two bunks for the two wireless operators, together with the necessary desk, locker, etc., and on the starboard side is a galley with Shipmate coal stove, ice-box, sink, store lockers, etc. There is also a dumb-waiter which leads up into the deckhouse, which, when the vessel is not underway, will be used for the officers' dining room.

A watertight bulkhead separates the galley from the engine room and next to this bulkhead are located the two main fuel tanks, each of 500-gallon capacity, and there is besides a 100-gallon fuel gravity tank. The fuel is pumped from the main tanks to the gravity tank, thereby insuring a constant pressure on the carbureter, so that the engines will operate under the same conditions whether the main tanks are full or nearly empty. The main tanks are located just forward of the center of buoyancy of the boat, so that the fore-and-aft trim will not be perceptibly disturbed with different weights of fuel aboard.

Aft of the engine room comes the quarters for the junior lieutenant and the ensign, with a berth on either side with two large drawers under, three wardrobes, and a large bureau. The officers' bathroom opens into this stateroom and in it are the shower bath, wash-basin and toilet. The room furthest aft is fitted up for the two non-commissioned officers, with two bunks on the starboard side, and wardrobe and bureau on the port side. A companionway leads from the room on to the after deck. Under the after deck is located the two 350-gallon water tanks, and also storage room for ammunition.

The raised deck is practically flush, with the exception of the pilothouse, in which there is installed a Navy type, bronze steering gear, also a standard 8-inch



Profile and Arrangement Plans of 74-Foot Patrol Boat, Building For George H. Earle, Designed by J. Murray Watts, Driven by Sterling Engines



Patrol Boat For George H. Earle, of Philadelphia



Philip Wunderle's New Patrol Boat, Now Nearly Completed

compass, and engine room telegraphs. At the after end of this house is a transom seat and table, which can be used either as a chart table or as a dining room for the officers when in harbor.

The hatch leading to the engine room is just aft of this deckhouse, and back of the hatch is located a signal mast 35 feet high, for the wireless installation, fitted with a signal yardarm and crow's nest. All around this deck are stanchions so fitted as to be removable when clearing ship for action, and on the port side are davits and gear, carrying the 14-foot power tender, which is equipped with a 2-h.p. Arrow engine. On the forward deck is a large liferaft, which together with the launch have a capacity for the fourteen men of the crew. This vessel, after running her trial trips, will be commissioned in the Government service.

The vessel for Philip Wunderle will be completed in October and will also go in the Government service. This vessel has 7 feet 6 inches headroom in the crew's quarters, which greatly adds to the comfort of the men. Not only is the hull specially strongly constructed, but the gun foundations are planned with a large factor of safety to withstand the heavy recoil of the latest type naval guns.

The foundations consist first of a 3-inch gun pad of oak, carefully calked and bolted on top of the 2-inch deck. Underneath the deck 6 by 6-inch deck beams are fitted in solid, and across the top of the deck beams are let in 6 by ¼-inch steel straps running diagonally from sheer strake to sheer strake and tying the deck beams solidly together. Underneath the deck beams are fore-and-aft strakes of hard pine 3 by 9 inches, and under these a ¼-inch plate through which the holding-down bolts of the gun foundations are fastened with



Margaret Just Before Launching

locknuts. To take the compression strains of the recoil, four extra heavy galvanized iron stanchions are run from this deck plate to heavy foundations alongside



Margaret, Ambulance Launch, Built by Hehre & Auer, From Designs by G. F. & A. W. Crouch, For Mr. and Mrs. Isaac N. Seligman and Presented to the St. John's Guild

the keel, and the tension strains are taken by 1-inch steel rods through bolted as shown. Besides the 6-inch deck beams which are fitted with 6-inch knees, there are also heavy 3½-inch steel angles worked to reinforce the deck beams and connecting the foundation with the frames, and running down the side nearly to the waterline.

The arrangement below decks shows a chain locker and storage space in the forepeak forward of the collision bulkhead. Then comes the crew's quarters for twelve men, with a mess table for twelve men, and ample locker space. Opening in the crew's quarters is a large galley 6 by 14 feet, equipped with Shipmate range, ice-box and sink and provision lockers. Amidships is the engine room, 13 by 14 feet, in which are installed the two heavy-duty Sterling engines, together with the electric equipment, and aft of the engine room are the quarters for the junior lieutenant and ensign, about 14 feet square. There are two bunks, three wardrobes, a bureau, a large locker for oilskins on the starboard side, and a toilet for the officers on the port side. A watertight bulkhead separates this room from the after lazarette, in which are installed the water tank and the ammunition cases.

The general dimensions are:

Length	74	feet
Breadth	15	"
Draught	4	"

Ambulance Launch Novel One-Man Type

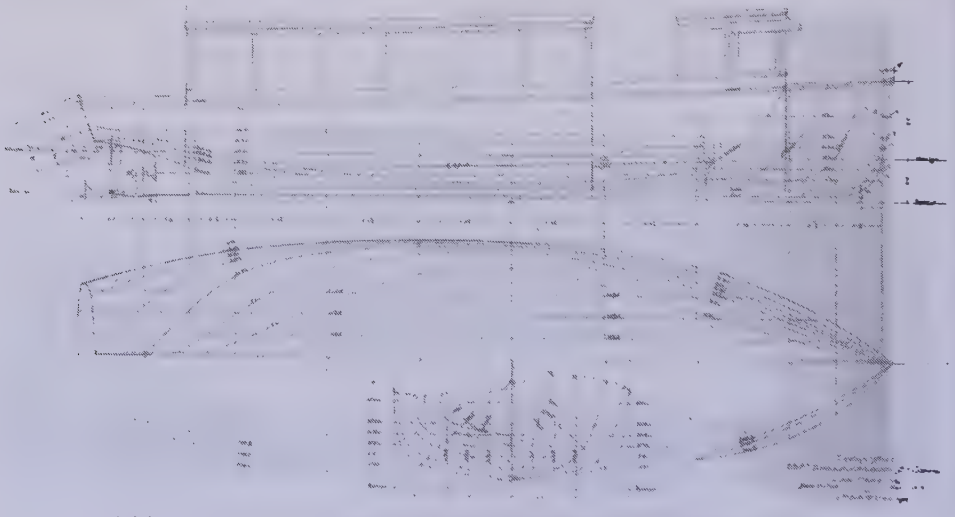
The St. John's Guild, noted for its work for the sick children of the city, has just put into service a new ambulance launch, which is being used to transfer the little patients from the larger craft of the Guild to the hospital for convalescents at New Dorp and the Seaside Hospital, located on the highest point of Staten Island.

The Margaret, as the new craft was christened, is the gift of Mr. and Mrs. Isaac N. Seligman, as a memorial. She was designed by G. F. & A. W. Crouch and built by Hehre & Auer, of Clason Point. If she had been finished with a cabin she would have been called a bridge deck cruiser, but instead of a cabin she has an open cockpit furnished with seats for a great many children, and there is a standing top to keep off the sun, and side curtains for inclement weather.

The craft is 38 feet long by 11 feet breadth, with 1-inch cedar planking copper fastened to oak frames 1½ by 1¾ inches, with trim and upper works of mahogany. She draws 20 inches. There is a pilothouse 5 feet long in front, and a bridge deck 4 feet long reached by a companionway from the pilothouse, and another companionway runs to the cockpit, which is 18 feet long. This leaves ample decks forward and aft, the latter reached by a companionway from the cockpit, and the forward deck from the pilothouse.

The boat is not operated from the bridge deck, as is customary, but from the pilothouse, where all controls are centered at the wheel, making it a one-man boat in the strictest sense. The bridge deck is for the crew of one, necessary because of the large number of children carried, and for officers and guests of the Guild visiting the hospitals. It is covered with a pipe-frame awning. A broad seat runs all around the cockpit, except where the staircases come down fore and aft, and cross seats and chairs give a total seating capacity of about forty. The fittings are galvanized, for it is not considered that the crew will have any time to polish brass.

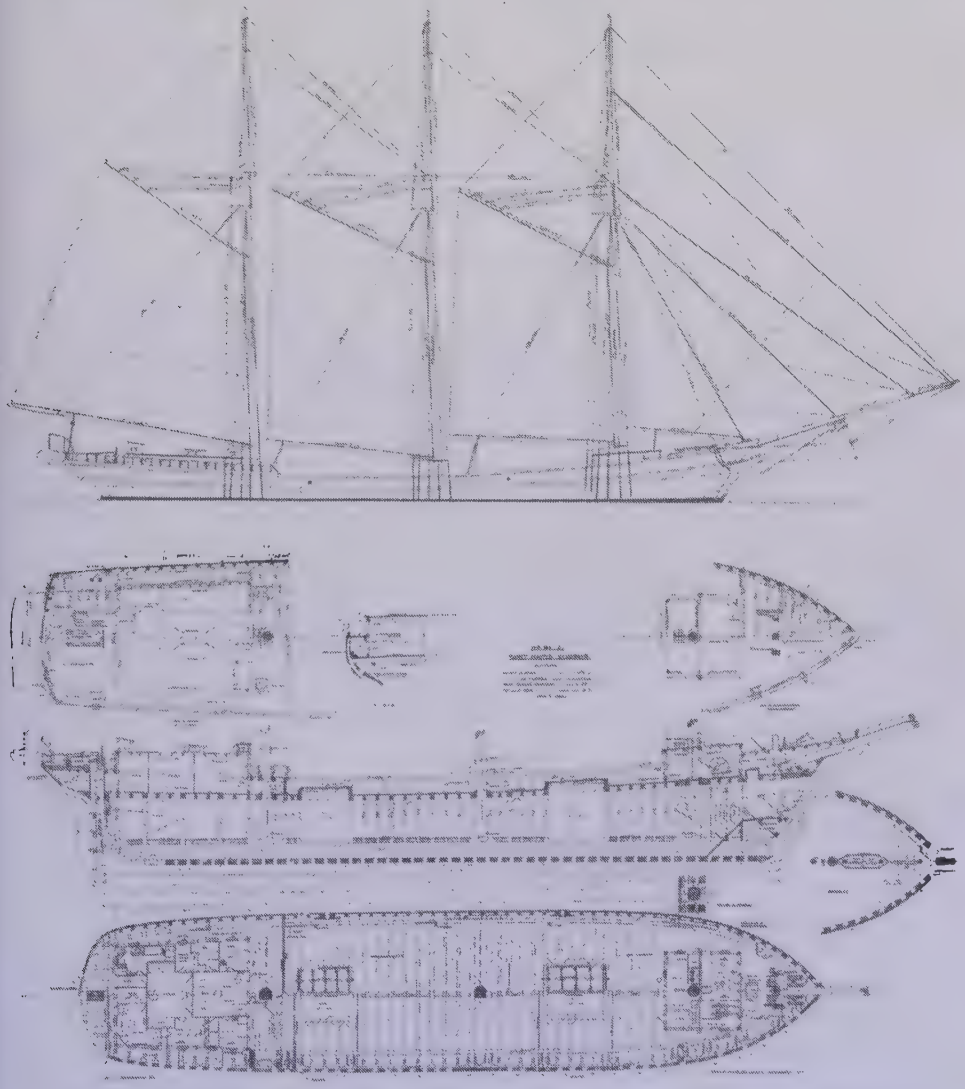
The power is a 40-50-h.p. Peerless heavy-duty engine, 5¾-inch bore by 7-inch stroke, turning 500 to 600 r.p.m., and developing actually about 40 h.p., driving the boat 10 miles per hour. It is equipped with jump-spark and Kingston dual magneto, and with the Leece-Neville two-



Ambulance Launch, Margaret, 38 Ft. Long, Built by Hehre & Auer; Equipped With a 40-50-H.P. Peerless Engine

unit starting system, the generator keeping a 24-volt storage battery charged. Electric lights throughout were installed. The engine is located under the bridge deck, with companionway from the pilothouse to the engine room, which is roomy and supplied with the usual lockers and other facilities.

She was christened by Elizabeth Husson, of Clason Point. Elaborate ceremonies had been planned for the launching, but a terrific downpour interfered, though the rain ceased long enough to permit her to take the water on the bottom only. Many children and representatives of St. John's Guild were present.



Sail and Construction Plans of 176-Foot Auxiliary Schooner, Built by J. W. Somerville, Gulfport, Miss., From Designs by Cox & Stevens

176-Foot Three-Masted Schooner

The three-masted schooner, Gertrude A. Somerville, shown in the accompanying plans, has just been completed at the yard of J. W. Somerville at Gulfport, Miss., from plans and specifications by Cox & Stevens, of New York.

The vessel is of the conventional type, single deck, with trunk cabin aft in which are the accommodations for the officers, a messroom and a pantry. A forward house provides for the galley and ice-box in the after end, the forecastle for six seamen on the port side at the forward end, and an engine room on the starboard side.

Power is supplied by a 10-h.p. vertical gasolene engine, which drives a No. 5 schooner-type windlass by messenger chain. It also turns a gypsy shaft for sail handling and operates two hooded bilge pumps. Fresh water to the extent of 1,400 gallons is carried in the fore hold and 700 gallons aft.

Two hatches, 10 by 10 feet and 10 by 12 feet, give access to the hold. Bow ports and brow are also provided for loading long lengths of lumber. The entire equipment is in accordance with the best modern practice, and the schooner has received the highest rating for her class with the American Bureau of Shipping. The construction is largely of yellow pine.

The principal dimensions are as follows:

Length o. a.	176	feet 0	inches
Length on main deck	159	" 0	"
Breadth, extreme	35	" 0	"
Depth of hold	14	" 3	"
Approximate deadweight.	900	tons	

Rudder Designing Competitions

ELEVEN designs were submitted in THE RUDDER competition for the prize offered for the best-arranged galley. The dimensions of the space to be devoted to this important part of any boat were given to the competitors and they were to arrange the interior so that it would be an easy matter to satisfy the appetites of all on board the craft. The galley of any vessel is most important, and if it is possible to furnish good food at all times and to serve it hot it will greatly mitigate the inconveniences caused by inclement weather.

The prize has been won by Miss Annie L. Jacobs, of Baltimore. The galley has been most admirably arranged and the plans well drawn. It is seldom that a woman enters a competition of this kind, and Miss Jacobs is to be congratulated on her success, particularly so as she states that this is her first venture. It shows, too, that the men will have to hustle, and that women will do as well in professional fields as they have in other work where they have come in direct competition with men.

Miss Jacobs has written a description of this galley, which follows:

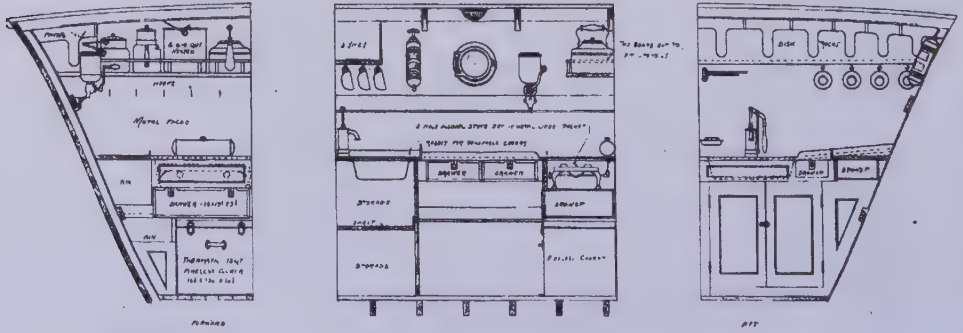
This being my first attempt in a prize competition, I will say that I am aided by my experience in designing a very similar galley on a 36-foot cruiser in which the conditions (except headroom) are similar, and I will say this for my effort, that it works well and allows the cook (myself in our case) to be out on the bridge. It is condensed, of necessity, and saves steps, and the fireless cooker particularly saves many an hour's time.

The stove is a two-burner alcohol, placed in a metal-lined pocket which serves the double purpose of catching fuel if, for any reason, it overflows (eliminating a fire danger), and also catches any food which might slop over in rough weather, confining the mess to one place, easily cleaned, and prevents it slopping all over the galley.

It will be noted that the stove is sunk far enough so that the stove top of the pocket acts as a much larger "rail" than that usually supplied with this type of stove.

Both stove pocket and sink have a rabbeted top cover board that completely conceals them when not in use, and gives more table room when preparing foods.

On account of the limited headroom a folding canvas-top camp stool, a little higher than the usual type, is recommended, and will be found to reduce profanity (even a sailorette swears) when preparing foods and cleaning up.



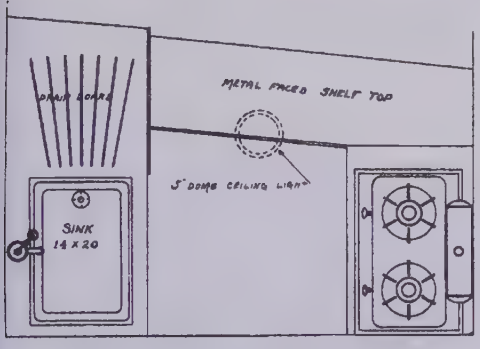
Prize-Winning Design in the Best-Arranged Galley Competition, Won by Miss Annie L. Jacobs, of Baltimore

Some may criticise the stove as having only two burners and no oven, but the fireless cooker will be found to quadruple size of stove, will cut down the time spent in galley and cut the fuel bills. As an oven, it can't be beat.

The stove legs have holes drilled in them that take four pins in the bottom of the pocket, which anchor the stove but permit it to be easily lifted out for cleaning the metal pocket.

It would seem, from the conditional dimensions, that this prize galley was located too far forward for the real comfort of the galley "slave," and in bad weather it would be harder to cook and to hold things in their places than in my own little galley, which is a bit aft of amidship, and also we have more headroom.

Every cooking utensil should have a place, and the larger ones particularly should be well fitted to their



Floor Plan of Galley Designed by Miss Annie L. Jacobs

places so they won't keep one up all night with the racket and noise of rattling pots and pans in rough weather.

Get tinned copper utensils if possible; failing which get tinned iron ones. Sporting goods stores sell camp cooking outfits which are ideal for cruisers and their nesting properties will be appreciated.

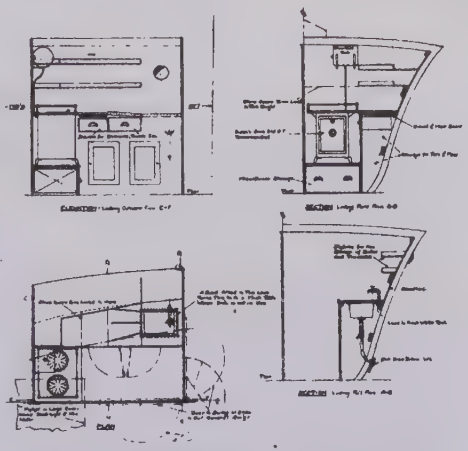
The sink is provided with a hole and stopper instead of the usual screen and serves the place of the unwieldy dishpan when washing dishes. The scale of the drawing is 1½ inches to the foot.

Those who submitted plans for the galley competition were:

Miss Annie L. Jacobs, Baltimore, Md.
H. C. Lenfest, Bronx, New York.
Leonard Chapman, Astoria, L. I.
T. Curtis Ould, Orange, N. J.
J. E. Shively, Napa, Cal.
C. E. Bradly, Fall River, Mass.
C. D. Davis, Marblehead, Mass.
Laurence Schips, Jr., New York City.
William Clark, Houston, Tex.
W. H. Taylor, New Bedford, Mass.
Arthur W. B. Wood, Merrick, L. I.

In addition to the plans of the winner, those of H. C. Lenfest and Leonard Chapman are published herewith, and other of the plans will appear in coming issues of THE RUDDER, together with the plans not yet published submitted in the other competitions.

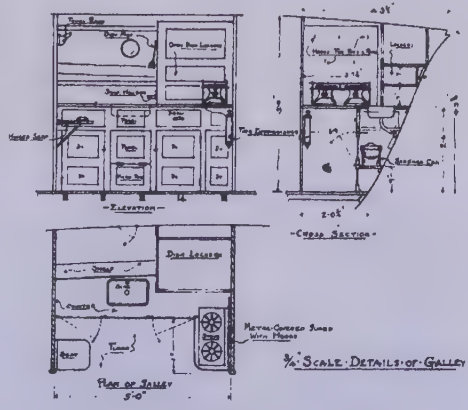
Two plans were submitted in the competition for the best-arranged stateroom. The judges, however, decided that they did not come up to the standard re-



Galley Plans Submitted by H. C. Lenfest, New York City

quired and so the prize is withheld. The competitors will, however, receive a subscription to THE RUDDER for one year, as have all who failed to win a prize in the other competitions.

Through a slight mix-up in the make-up of THE RUDDER last month the wrong caption lines were put under the interior accommodation plans. The first prize, $15, was won by W. W. Haertel, as was stated, and his winning plans were properly named. The second prize was won by D. P. McMillan, who lives in Vancouver, B. C. Mr. McMillan's plan was printed as the second prize winner but it was credited to Sidney S. Griffes. Unfortunately, Mr. McMillan's name and address had been lost and the third plan, which was credited to him, was marked as coming from "Beaver". The set of plans placed third were those of Sidney S. Griffes, and they were so nearly equal to the plans of Mr. McMillan that THE RUDDER adds a third prize for this competition.



Well-Arranged Galley Designed by Leonard Chapman

The Honor Roll

The Rudder herewith publishes another list of club members deserving of honor. They have responded to their country's call in this time of trouble. Commodores and secretaries of yacht clubs are requested to send to The Rudder the names of members who have enrolled in any department of public service. There are still many who have not responded to this invitation.

EASTERN YACHT CLUB

(Second List)

Commodore Herbert M. Sears.....Red Cross Service abroad

BEVERLY YACHT CLUB

Charles Brand..... ..Naval Constructor, rank Lieutenant
Horace Butler .....Ensign, Naval Coast Defense Reserve
Wm. A. Cortright, Jr. ....Quartermaster, 2d Class, N. C. D. R.
Thomas F. Holloway .....Aviation Service
Walter Jones .....2d Lieutenant, O. R. T. C.
Brian B. Kane .....Appointed to Annapolis
Wm. T. Kird, 3d.....Ensign, Coast Defense Reserve, and now at Annapolis
Robert T. Linderman .....Naval Coast Defense Reserve
Otto P. Mann .....Applied for enlistment in U. S. A. Ordnance Department. Rejected for physical reasons.
D. Woodnut Pettit .....Enrolled in Coast Defense Reserve; declined for physical reasons
Carl P. Mann .....At 2d Officers' Training Camp

CHELSEA YACHT CLUB

Commodore W. F. McIntosh..Musician on U. S. S. Kearsarge
A. R. Busteed .....U. S. Signal Corps
George E. Winsor .....Private, U. S. Army.
Jere Taylor .....2d Lieutenant, State Guard
N. F. Wass .....State Guard
W. F. McIntosh, Jr. ....Coast Defense Reserve

CRESCENT ATHLETIC CLUB

(Second List)

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J. P. Hopkins .....Captain, U. S. A.
Gilbert C. Halsted, Jr. .....1st Lieutenant, Ordnance, U. S. A.
John L. Jennings .....Lieutenant, U. S. N.
W. J. Littell .....Paymaster, U. S. N.
R. F. Mochle .....Lieutenant, U. S. N.
Effingham Wilson .....Major, U. S. Marine Corps
G. M. Dodwell .....Lieutenant, British Army
Kenneth L. Street .....British Army, 48th Highlanders
T. A. Macfarlane .....Lieutenant, Royal Field Artillery
Paul Barrett .....French Flying Corps
Pierre Barrett .....French Army
Prosper Cholet .....French Army
William P. Willets .....1st Lieutenant, Signal Corps
F. H. Knight .....Captain, Army Medical Corps
F. R Herriman .....Army Medical Corps, Ft. Ogelthorpe
James Robb .....Major, 23d Inf. N. G., Depot Battalion
T. H. S Andrews ....Lieutenant, 2d Field Art., N. G., U. S. A.
Henry H. Royce .....Major, 2d Signal Corps Depot Unit
L. H. de Brau ....Lieutenant, 2d Signal Corps, N. G., U. S. A.
Edward A. Vossler .....7th Reg., N. G., U. S. A.
J. P. Hurl v .....Captain, 69th Inf., N. G., U. S. A.
Charles N. Schenck, Jr. .....8th Art. Corps, C. D.

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John H. Andrews
John J. Barry
Edward B. Brooks
C. E. Butz
Mortimer W. Byers
Harry H. Clark
J. B. Chittenden
Richard F. Cole
Lewis E. A. Drummond
Bruce R. Duncan
John Enequist
Charles A. Freeburn
Melville J. France
G. Herbert Henshaw
George Hewlett
James de Gaudenzi ..... O. T. C., Augusta
Frank S. Hyatt
Dr. James J. Keyes
Paul L. Lahm
Arthur J. O'Keeffe
William H. Palmer
William M. Patterson
William A. Phillips
K. J. Lloyd Prince
A. H. Sweeney
Horatio F. Taylor
Herman G. Triess
Martin S Van Brunt
Philip L. Watkins
Francis J. White

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Colonel Charles I. de Bevoise — Captain James Curie
Lieut.-Col. J. Crook McLear — Lieutenant Charles McDougall
Lieutenant H. P. Pearson

Troop A

Captain Harold H. Donaldson — Private Gordon Parker
Sergeant Edward H. Walker — Lieutenant Donald M. Ogilva
Private Hugh C. Oram

Troop C

Private Arthur Coburn — Private Howell E. Sayre

Troop E

Sergeant W. M. Lee

Troop I

Sergeant Samuel Greason, Jr. — Private Irving Valentine
Private Henry Seipp — Private S. A. Coykendall, Jr.

Troop L

Lieutenant Harold W. Bousfield

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Capt. Edwin Hicks Bigelow — 2d Lieut. J. Vance Lauderdale
Capt. Wallace T. Jones, Jr. — 2d Lieut. Albert E Billings
Capt. Charles M. Bull, Jr. — 2d Lieut. Robert B. Sasseen
2d Lieut. G. E. Graffmuller

Engineers' Corps

Major John C. Ostrup — Captain Oliver P Allen
Captain Roy R. Ross

Cavalry Section

2d Lieut. Norman K. Toerge

Field Artillery Section

1st Lieut. Samuel J. Reir, Jr. — 2d Lieut. Keith F. McVaugh
1st Lieut. Henry H. Ketcham — 2d Lieut. Ashley E. Pidgeon
2d Lieut. Drew McKenna

Officers' Training Camp, Plattsburg

Lee H. Bristol — Arthur J. Horton
Henry P. Bristol — W. M. Keppel
Foster Crampton — E. F. Mulholland
Charles F. Donnelly — H O. Parsons
Seneca D. Eldredge — Gilbert H. Thirkield
Ralph E. Hemstreet — H. C. Thorn, Jr.

Fourteenth Infantry, N. G., U. S. A.

Colonel James R. Howlett — Lieutenant Charles A Kelly
Captain J. Gardiner Conroy — (Depot Battalion)
Lieutenant Edgar J. Williams — Corporal James F. Hurley
(Depot Battalion)

HORSESHOE HARBOR YACHT CLUB

Richard O. H. Hill.....Machinist's Mate, 2d Class, U. S. Naval Reserve
Edward B. Bruch .....Colonel in command of Cadet Camp at Peekskill, and now on Reserve Officers' Force List for assignment
Hans Goldschmidt.. A prisoner in one of the European Camps
T. J. McCahill .....With contingent detailed from Society of the War of 1812
W. B. Short, M.D.....1st Lieutenant of Second Artillery, now on Officers' Reserve Corps
George S. Towle .....Captain at Cadet Camp at Peekskill

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

Dr. Cooley Builds a Sea Pup

Editor of THE RUDDER:

In May and June, 1915, THE RUDDER published designs of a 12-foot "Outboard Motor, Rowing and Sailing Dinghy," by Mr. F. W. Goeller. I was attracted by them as promising about the kind of boat I wanted, and last Winter decided on this as my first attempt at boat-building.

Having read many "How To" articles in THE RUDDER, I am tempted to go into details and make this a "How Not To," but as I came out all right in the end, I'll spare you my long story of fool mistakes. For the benefit of other prospective builders, however, I will say that the makers of knock-down frames are not necessarily perfectly reliable; that my frame was made from the designs by an extensively advertised concern.

In addition to a good deal of careless work, they made the frame 1½ inches too deep amidship, spoiling the sheer line, and cut the centerboard slot a foot too far aft. This, fortunately, did not make the difference in windward work which I feared it might.

I have used the boat this Summer on a large inland lake, and my chief object in writing to you is to say that to my mind the model is altogether the best I have seen for a boat of this kind. She sails very well indeed, is not too hard to row, makes better than six miles with any ordinary rowboat engine, and carries safely and comfortably an astonishing number of people. I was asked many times where a similar boat could be bought, and was sorry that I didn't know of a builder who made one. It would be a popular model, I think.

When my hull was planked, I felt that it was hardly stiff enough, and put in a few extra ribs. If I were building over again I should either space the ribs 8 inches, or make them 1¼ inches instead of ¾ inch; also I would not use a daggerboard, which is a nuisance, but would make the trunk 2 feet long, and have the board project only a foot below the keel, so it could house in the trunk.

I feel very much indebted to Mr. Goeller and THE RUDDER for the satisfaction I have had in the boat.

Detroit, Mich. THOMAS B. COOLEY.

Storage Batteries in Winter

Editor of THE RUDDER:

On reading over the May, 1917, issue of your magazine I was interested in an article by Mr. Charles A. Starr. This was in reference to the electric equipment of one's boat.

He spoke in one place about the winter keeping of a storage battery. He states that a battery should be washed out after emptying the electrolyte. The electrolyte, as I understand it, is the liquid now in the battery. This wants to be emptied out; but how do you wash the battery?

Massachussetts. C. W. DEARDEN.

It is much better to store the battery where it will be regularly charged once a month through the Winter. It is not a nice job to take it apart to clean, for if the electrolyte spills on the clothing it will turn the cloth red and eat a hole through. But where one cannot get to a battery service station, it is possible to store the battery at home if one cares to take the trouble. The battery should be fully charged.

The electrolyte should be emptied into a glass bottle and put where it will not freeze. If the battery is one where the top is fastened on with screws, remove these and lift top and plates from the cells. Next remove the separators from between the plates. Rinse off both plates and separators thoroughly with distilled water and wash out each cell, being careful to remove all sediment from the bottom. When plates and separators are dry, reassemble the battery. Do not let the plates stand with acid on them, or they will heat and it may ruin them. When reassembled fill to the top of the plates with distilled water and store where it will not freeze. If in a warm place, where the water might evaporate, distilled water should be added occasionally, though this should not be necessary.

Where the top of the battery is covered with sealing wax, it will be necessary to remove this before the battery can be taken apart, and this sealing wax must be poured on hot again in the Spring to seal up the battery.

To put the battery in service it should be refilled with the electrolyte taken out, which will be the right solution for the plates. If any has been spilled, new electrolyte should be added, which in most cases consists of a 25% solution of sulphuric acid. The solution should just cover the tops of the plates. The battery must be fully charged before it is ready for service, and if it has to be sent to a charging station for this, it were better to let the filling with electrolyte be done there.

Owner—Designer—Builder

In the August issue of THE RUDDER an editorial was printed under the heading "Owner—Designer—Builder." It set forth the present condition of yachting and then made suggestions for the betterment of the sport and the building industry.

This article has been widely read and been the cause of much discussion. Many influential yachtsmen, who have the interest of the sport at heart, and some builders have sent their views to the editor of THE RUDDER. These letters are of such general interest that they are to be published in THE RUDDER and the first batch is given herewith. There are too many for one issue and the discussion will be continued as long as the interest lasts.—EDITOR.

Editor of THE RUDDER:

You have been good enough, under date of August 30th, to send me a copy of your editorial under the caption "Owner—Designer—Builder."

The article is excellent and is timely. The yachting fraternity will doubtless and universally endorse it.

If I can be useful in any branch of this delightful sport by discussing it, it is only in respect of power boating and large power yachts, and I would say, to be brief, that we who dwell on the Sound and can afford it, and who contemplate, as I do, mainly trips to New York and yachting excursions not much farther East than Bar Harbor, should own a fast power launch, a day cruiser as they are now called—about 25 miles per hour to be made with comfort—launch not over 75 feet long, and should in addition own a real steamer at least 100 feet longer, thoroughly comfortable in every way, and reasonably seaworthy. That would be the entire equipment and it will take the owner comfortably to New York daily and elsewhere when at leisure for real yachting experiences.

I do not think that the intermediate boats between 75 feet in length and say not less than 175 feet amount to much in the long run, whether they be gasolene-driven, or steam, or oil-producer gas. The latter would be fine but is too cumbersome, and a modified type of the Diesel engine will probably in the long run be the ideal engine for slower-going and larger craft.

Sailing is delightful, but there are thousands far more competent than I to discuss this sport.

What you say about shipyards which address themselves more particularly to yacht construction is true, every word of it, insofar as my limited experience enables me to judge.

Of course so large a subject as you have taken up in your article will require many more to admit of even reasonably exhaustive discussion.

New York. AUGUST HECKSCHER.

* * *

Editor of THE RUDDER:

Yacht designers and builders should consider the reasons which sell low-priced automobiles and second-hand cars. The real field for yachting is of the same character as for motoring, although limited by proximity to navigable water. Those who cater only to the wealthy and to the male limit the field.

The sort of boat that the buyer second-hand wants should be the basis of design. Distinctiveness is desirable but marketability should not be overlooked. The fleets of the innumerable small yacht clubs tell us that the regulation type should be a cruiser with a turn of speed, and in size and cost suitable for the family of average means. Rules for racing yachts should tend to this end.

The commercial and sporting possibilities of yachting are not in costly fashion but in inexpensive pleasure.

Providence, R. I. W. LOUIS FROST,
Secretary, Narragansett Bay Y. R. A.

* * *

Editor of THE RUDDER:

Replying to your letter of August 30th, and editorial concerning the yachting situation, I must say that my opinion, if I had one, as to the producing end, would be of no value.

But for nearly thirty years I have suffered a passion for yachts, and have, as much as one of very slight means could, built, owned, and sailed a variety of small craft. I have been a rebel against our racing system for many years. I think it has never done anything but damage real yachting, except the small one-design classes. Realizing I am no mathematician, I have believed, nevertheless, that every racing rule, and especially the modern ones, has involved serious misconceptions, fundamental and fatal. The theory has been that we did not know what elements were needed in yacht design to bring about a universally desired result, that is, a fleet of seaworthy and comfortable sailing craft, with such speed *under real conditions of use,* and *not racing conditions,* as would be as high as possible without sacrifice of more essential qualities.

Here on fresh water I am told that the universal measurement boats, notably P Class, though extremely fast, are anything but comfortable and livable craft. Such boats drive men into port and to hotels.

I have long believed, though I have never heard it, that the elements of design, displacement, breadth, draught to rabbet, total draught at two points of contour, nature of overhangs and freeboard, could be specified within limits for every class, with a sliding scale as between displacement, breadth and draught, the same as with respect to scantling, the only field in which the rules have made a betterment, or rather, warded off ignominious failure.

Is there anything in this idea? I do not know.

And it seems to me that the absurdities of sail measurement legislation could be obviated, perhaps by approval in advance of a spar design, and subsequent re-examination as needed. It is fearful to have spars so short that a natural stretch of sail cannot be accommodated.

The trouble with yacht rule-making is the trouble of all American government and legislation—it is slot-machine legislation. We try to make government automatic, instead of trusting responsible officials and giving them power to supervise and regulate.

Personally, the shoe does not pinch. I am interested in racing mainly in the hope that racing will produce craft to augment the cruising fleet. I have a Cary Smith schooner, getting old, but better than the newer broods. I have lived aboard all this Summer, with one or more companions. I live afloat because I love boats and water. My living comforts are so well supplied that I am always at my destination, for my destination is the water generally, wherever I chance to be, in port or out.

I have for a number of years looked to the extinction of the sail. I fear nothing can save it. The auxiliary engine seems to prevent learning most of seamanship. It hurts because it enables one to get there—"There" being dry land.

Please pardon my leeway.

Chicago, Ill. HERBERT HARLEY.

* * *

Editor of THE RUDDER:

In response to your invitation for criticism of your August editorial, I will enter my views as follows:

It is as you say, the present-day boats, both power and sail, are going into freak classes, with everything sacrificed for speed.

In my opinion what would help the sport more than anything else would be for race committees to pay less attention to restricted classes in sailing and to put some mark of merit on stability in power-boating. That, I

think, would eliminate many of the present-day classes that cannot go out of sight of home with comfort.

If the stock builders would get out boats that are seaworthy, of moderate speed, and so of moderate cost of upkeep, and drop the so-called express type, I think that would bring many into the game.

To sum up: Drop the restricted classes. Unstability to be taxed. No express type.

In addition would say, have all races in both sail and power, cruising trim, and enforce the rule to the limit.

Toledo, Ohio. J. W. MARSHALL, JR.

* * *

Editor of THE RUDDER:

I am in receipt of yours of August 30th. To answer it properly, it would take many more words than are in the editorial, so I will only touch on two or three points. First, to have a yacht-building plant comparable with the automobile plants, it would mean that there ought to be as much demand for yachts as there is for automobiles. Fortunately, this is wrong, because hardly 10% of the people use boats while almost 100% use automobiles. The variation between a motorcycle, the cheapest form of automobile, and a Rolls Royce, one of the highest priced automobiles, only covers a range of let us say $100 and $10,000, whereas the range between yachts or power boats varies from $100 up to say $1,000,000, and if you will take the number of automobiles as compared with the number of boats, multiplied by the difference in price between the smallest power boat and the handsomest yacht, I think it will answer your question practically.

Wilmington, Del. COLEMAN DU PONT.

* * *

Editor of THE RUDDER:

Replying to yours of the 6th, I have not the time to enter into much of a discussion in regard to your editorial, but I will say that I am thoroughly in accord with the views that you expressed therein.

New York. E. C. MYRICK.

* * *

Editor of THE RUDDER:

Replying to your letter of Sept. 6th, would say that I agree with everything you have to say in the editorial of August and with Mr. Haddock on everything he has to say on "Seagoing Power Boats," in your July number.

Boston, Mass. RICHARD HITCHINSON.

* * *

Editor of THE RUDDER:

Having had merely three-years' experience in the power-boat game, my opinion may not be worth much. However, as I have had considerably more in the manufacturing game, my view from that angle may be of more value.

To me the answer is "Education". Education of the builder in efficient shop practice; education of the owner to the fact that half the time he does not know what he wants, or what is practical.

There is no reason why a stock model should not be a huge success. A 30-foot cabin cruiser to sell at $1,000 would be a boon to everyone entering the power-boat game. Although I have not given the matter special consideration, it seems that, with proper manufacturing facilities, there should be no trouble in achieving this result. The point to be driven home to the owner, is the impossibility of combining all advantages in one type of boat. The majority of features which the owner considers of such importance are of slight value when the craft is in commission. The designers should get together and evolve three or four designs combining as many valuable features as possible. By building along these plans the best interests of all concerned would be served. In closing would suggest that a "trade association" would be very helpful.

Thanking you for views on the subject, and with best wishes for success of your campaign.

New York City. IRVING LEVI.

Chart Table

Editor of THE RUDDER:

Where could I find a good article on learning to box the compass?

New York. T. F. JONES.

Most any good book on seamanship will give you a method to follow in learning the compass. The following rules are generally given in all standard works on seamanship:

1. Never read from a point that begins and ends with the same letter, such as E.N.E.

2. Read from each side of every cardinal and half-cardinal point.

3. To read a compass always commence with the ¼ point, and work towards the nearest cardinal point, except when you come to a point that, by your result, you cannot read from there, go to the next point and commence with a ¾ point from it.

* * *

Editor of THE RUDDER:

What is the angle the helm makes when it exerts the greatest turning effort?

Flatbush. X. Y. Z.

Theoretically 45°, but beyond 40° in practical test it is found there is no increase in the effectiveness of the rudder.

* * *

Editor of THE RUDDER:

What is the technical difference between a yawl and a ketch?

Patchogue, L. I. SAILOR.

In a yawl the mizzenmast is aft of the rudder post; in a ketch it is forward of the rudder post.

* * *

Editor of THE RUDDER:

What is the speed with which sound travels under normal condition?

Boston. INQUIRER.

About 1,125 feet per second at 62° Fahrenheit.

* * *

Editor of THE RUDDER:

Suppose you were running in a fog, and heard two signal blasts of a steamer's whistle ahead. What would you do?

Connecticut. A. CUMMINGS.

Two long blasts means that her engines are stopped, so keep weigh on your ship, and crawl away from her.

* * *

Editor of THE RUDDER:

Suppose you met a patrol boat flying code flag H, what would you do?

Providence. CRUISER.

Stop, heave to and find out what he wants.

THE RUDDER

[Title Registered U. S. Pat. Office]

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

"Mysterious" Gasolene Explosions

An interesting though hardly novel experiment in the use of gasolene on shipboard was made recently at a place which need only be indicated as "Somewhere" on a vessel of some 70 odd feet length, by name T. Q. XXX. A stop was made at a gasolene station to fill the tank, of several hundred gallons capacity. A deck plate was unscrewed, the tank being some distance below the deck and closed by the usual screw plate, which was also removed. There was no vent to the tank, no indicator to show when it was full, and no pipe connection between tank and deck. The tank being "empty," naturally contained a highly explosive mixture of air and gasolene. When a 3-inch hose was inserted and the gasolene turned on there was only one place where this heavy mixture could go; it was expelled from the tank and rolled over the top, beneath the deck, and fell into the bilge. Whether the filling operation was accompanied by the usual overflow of liquid gasolene as well is not stated. The tank was closed, the deck plate screwed down and the engines started to back out of the slip, when the inevitable happened; the sides of the vessel bulged below water, the deck lifted, carrying a badly injured man with it; two others badly burned went overboard forward and two more fortunate ones on the after deck escaped with a mud-and-water bath. Four men were taken to the hospital. As ample means for fire-fighting were at hand the fire was soon extinguished and the bilged hull pumped out and secured from sinking. A brief account of the "accident" found its way into some of the papers with the information that no cause could be assigned for the "mysterious explosion"; still another similarly designated as "mysterious" was reported a short time later, but of this we have no details.

There was a time some years ago when such occurrences were in a measure excusable, the nature of gasolene vapor, its weight and the certainty of it reaching the lowest part of a vessel and lying there like shot until removed by force not being generally understood. Today there is no excuse for a designer or builder who will countenance such an installation as described, and equally little for the master of a vessel who, when unfortunate enough to be in charge of such an installation, does not know the danger and guard against it.

R. W. Rathborne

There is no reason why the user of a power boat should not equal in all respects the sailing yachtsman; the two branches of the sport are much alike in their charm and their responsibilities, and, in spite of the prejudices of the old sailing men, the problems of power are quite as fascinating and inviting as those of sail. It is a question, however, whether the generation now making its first essay at the wheels of power boats will make as good a showing forty years hence as that which started in the seventies at the tillers of the old shoal-draught catboats. Another of this rapidly closing circle passed away on August 16th at the age of seventy-four in the person of R. W. Rathborne, an athlete, oarsman and yachtsman whose record, though by no means exceptional for the men of his day, is notable in the annals of amateur sport on New York waters.

"Shorty," as he was affectionately known from Spuyten Teufel to Block Island for nearly fifty years, was one of the large family of the late Captain Richard Rathborne, of H. M. Ninth Dragoon Guards, of County Galway, Ireland; the greater part of his life was spent about New York, and he was in all respects a good American. As a very young man he was threatened with tuberculosis and advised to take as much outdoor exercise as possible; he joined the New York Athletic Club shortly after its organization in 1868, and devoted himself to rowing and athletic sports. Throughout the seventies he was known as one of the leading oarsmen of New York at a time when rowing was one of the most popular of American sports; under the average height, as his sobriquet indicated, and light in weight, he was all muscle and pluck, and with a style that placed him among the first oarsmen of even that notable day. He excelled as a single sculler, holding the Diamond Sculls of the Harlem River for several years; he rowed on the club four, and also won many races, including the championship at Saratoga, with the double sculls.

During this time, when the pedestrian fever was at its height, he competed successfully in walking matches (throughout his life walking was one of his favorite diversions) and he was one of the famous tug-of-war team of the New York Athletic Club; his strength, grit and knowledge of sport making him a very useful man in spite of his light weight. It is told that in one competition, in Madison Square Garden, the giants of the New York Athletic Club team, including Buermeyer and Struthers, had weighed in and come dangerously close to the limit when the other side asked, "Where is your other man?" "Here," said the big Buermeyer, as he held aloft a chair with "Shorty's" 125 lb in it.

About 1880 Mr. Rathborne gave up rowing for yachting, one of his first yachts being Sea Drift, a summer-cabin catboat 20 feet 10 inches over all, of what was known as the "log-keel" type, built by Rand Burr at Bay Shore, Long Island; joining the Knickerbocker Y. C., then located at Port Morris, and noted for the number of keen young Corinthians among its members. In 1882 Sea Drift was sold to Mr. E. P. Mowton, of the same club, who sailed her for some years under the name of Rex and, incidentally, made a cruise around Long Island in her. Her successor was a 28-foot South Bay sloop.

Reverie, sold in the following year when, with Mr. T. C. Zerega, Mr. Rathborne built the cutter Surf. This yacht, designed by John Harvey, was 43 feet over all, 35 feet 4 inches water-line, 7 feet 6 inches in breadth and drew 7 feet 4 inches; she had the characteristic faults of the Harvey model, extreme fullness about the garboards in the middle body, fine ends and very steep buttock lines. A yacht of her dimensions to be in any way successful required the lightest possible construction and as much of her displacement as possible in her lead keel; Surf was rather heavily constructed and had a large proportion of her ballast inside.

After three seasons of racing and cruising in Surf the half-interest was sold to Mr. Zerega, and Mr. Rathborne cruised about the Sound in a lapstrake centerboard sloop of the Block Island type, also sailing with the late G. C. Barnette after the latter built the keel sloop Io, 28 feet 6 inches over all, in 1889. In 1893 Mr. Rathborne bought Io, cruising in her until 1900, when he replaced her with the Burgess cutter Mopsa, 35 feet 2 inches over all; this latter yacht having been broken up only a short time ago after an honorable career of twenty-eight years. In 1903 Mopsa gave place to another Burgess boat, the 30-footer Saladin, sold in 1912 when failing health obliged her owner to give up yachting. During the latter years of his life he suffered severely from rheumatism and at the time of his death he was practically blind. Mr. Rathborne was for some years a member of the New York Stock Exchange, but early in life he made the resolution to retire as soon as he was able to live comfortably in pursuit of his favorite sports. This resolution he carried out many years ago. He never married, but made his home at Pelham Manor, close to the New York Athletic Club, with two sisters. At the time of his death he was No. 3 on the roll of the New York Athletic Club and he was also for some years a member of the Seawanhaka-Corinthian Y. C.

Books for Students of Naval Architecture

The Editor of THE RUDDER has asked Mr. Charles Desmond to cooperate in planning a course of reading and study suitable for readers of THE RUDDER who desire to increase their knowledge of naval architecture, marine drafting and construction. Mr. Desmond was asked to do his best to plan for men who could only devote a little of their spare time to reading and study, and also to keep in mind the men who have had very little technical educational advantages.

After considerable thought on the matter, Mr. Desmond has planned a course of study and reading that, if followed according to instructions, will enable anyone having an ordinary education to learn the fundamental rules of naval architecture and yacht designing. The books selected are all standard works, obtainable through THE RUDDER Book Department. Mr. Desmond has been particularly careful to select only those books that are likely to be clearly understandable to men without technical education or knowledge.

The books cover these subjects: Mathematics; Naval Architecture; Boat Construction; Shop Management; Drafting; Lettering; Elements of Physics.

In the next issue of THE RUDDER, Mr. Desmond will give a complete list of the books, and on charts and tables will give details of suggested periods of study and reading which, if followed, will enable all who desire to do so to improve their knowledge of the subjects mentioned.

William H. Simonson

The death of William H. Simonson, on September 5th, brings to mind one of the smaller metropolitan yacht clubs which was well known in its day, when the racing of open sandbaggers was one of the most popular forms of yachting about New York and the West end of Long Island Sound. The Manhattan Y. C. was organized and incorporated in 1870 by residents of Harlem, then an isolated suburb of New York City, accessible only by horse-cars and the fast steamers plying on the East River from Peck Slip. Associated with Mr. Simonson in the establishment of the club were Jacob Varian, owner of the open sloop Joe Jefferson, with his sons Charles R. and Alfred, the latter for many years secretary of the Knickerbocker Y. C.; General J. M. Varian, owner of the sloop Sophia Emma, and his son, J. M. Varian, Jr., and John D. Brassington. The East River shore in the vicinity of Hell Gate, from 90th to about 100th streets, now built up with apartment houses, was then low ground in the course of filling-in with city garbage. The infant club found an abiding place in an old canal boat moored on the beach off the foot of 99th Street near Second Avenue, about on a line with Mill Rock. Mr. Simonson served for some years as the secretary of the club, which moved after a short time to South Brother Island, near the Eastern end of the Gate. The island was hardly accessible from what is now Bronx Borough, then a remote and sparsely settled suburb on the mainland; and in 1874 the club moved back to Manhattan Island and established itself in a modest house at the foot of 89th Street. Though close to the turbulent waters of the Gate, a little cove and an accommodating eddy made a very snug anchorage for the club fleet, which soon included the Herreshoff sloop Orion, a noted yacht in her day, owned by J. W. Cooper, and Zephyr, a converted ship's boat, 18 feet long, owned by John Hyslop, who joined the club in 1872 and started that work of measuring yachts for which he has been noted even since. Mr. Simonson owned several small open yachts prior to 1888, in which year the centerboard cat Aura, 32 feet by 11 feet 2 inches, was built for him by G. W. Byles of City Island from a model by Henry Andruss. This yacht he used in racing and cruising about the Sound until 1909, when he replaced her with the new yawl Feu Follet, 55 feet over all, designed by himself and also built by Byles. Mr. Simonson, who was descended from the early settlers of Manhattan, was born in 1843; he graduated from the College of the City of New York and entered the firm of T. H. Simonson & Co., lumber dealers, only retiring about five years ago. He was at times a member of the New Rochelle and Shelter Island and later of the New York yacht clubs; he was also one of the founders of the old Federal Republican Club. The Manhattan Y. C. passed out of existence nearly twenty years ago, being driven from its home to make way for a city park. The members joined the Larchmont, New Rochelle and other Sound clubs, but during the thirty years of its existence it held a loyal membership of old-time yachtsmen, the Coopers during their lifetime, Mr. Simonson, John Hyslop, Henry Andruss and a few other congenial spirits, whose love of sailing induced them to brave the discomforts and often the dangers of Hell Gate and the East River in

shoal open boats with the big rigs once considered necessary, to be kept right-side up only by exceptional skill and constant vigilance.

* * *

The supplement this month is the fast steam yacht Flying Fox, which was built in 1909 from designs by Cox & King for Peter W. Rouss. She was built by the Yarrow Company at Glasgow and was convoyed across the ocean. Flying Fox is now the property of C. K. G. Billings. She is 165 feet long, 15 feet 6 inches breadth, 9 feet draught, and is driven by three Parsons turbine engines. * * *

In December THE RUDDER will publish its foreign number. THE RUDDER'S readers abroad are many, and this special number will set before them the fine boats of many types and the variety of engines which they may want. After the war the foreign fields will open up to American manufacturers as never before and those who are ready for the big boom that is bound to come will reap huge profits.

Spokes from the Rudder Wheel

The steam yacht Vanadis, originally owned by C. K. G. Billings and more recently by Commodore Morton F. Plant, was lost at sea while on her way to Archangel recently. The Vanadis had been sold to Russia and, before leaving, had been fitted with oil burners. When 160 miles East of Cape Breton an explosion set fire to the oil and the yacht soon sank. All the sixty-four members of the crew were saved.

* * *

Morris M. Whitaker is now associated with F. Huntington Clark in the construction of cement barges.

* * *

Fifty-five yachts entered in the Inter-Club subscription regatta for the benefit of the American Red Cross. Unfortunately, an Easterly storm on September 8th caused a postponement until the following Saturday, and then less than half the number entered showed up. The races were sailed on the Sound off Greenwich. The regatta was managed by De Forest Hicks, Seawanhaka-Corinthian Y. C.; Howell C. Perrin, Larchmont Y. C.; Richard A. Monks, Indian Harbor Y. C.; Ernest G. Draper, Stamford Y. C., and Frank Bowne Jones, Indian Harbor Y. C., who acted as secretary.

* * *

Commodore James B. Ford's 38-footer Varuna with her Marconi rig has shown that she is the fastest of the Larchmont new class of sloops. In all the trials she has finished in the lead. Butler Whiting has been sailing the yacht. * * *

Colonel F. C. Goldsborough, for thirty years Commodore of the Chesapeake Bay Y. C., was accidentally drowned in the Tred Avon River at Oxford, Md., on September 4th. The officers and governors of the club at a special meeting passed suitable resolutions, which will be engrossed and sent to the family of the Commodore. * * *

A slight idea of the money being made out of cargo-carrying vessels just now is instanced in the schooner Glynn. She was built less than a year ago at a cost of $63,000. The owner sold the schooner soon afterwards for $75,000. The new owner sent her across the Atlantic, for which he received $52,000 freight tolls, and then sold the vessel to French interests for $90,000.

* * *

Savannah is growing as a shipbuilding center. The first of four schooners, named Chaska, was launched recently from the yard of the Savannah Engineering Construction Company. Two schooners are building at the Georgia Shipbuilding Company's yard. The Terry Shipbuilding Company has started work on twenty composite vessels. Nine are to be built by the National Shipbuilding and Dry Dock Company. The total value of vessels now under construction is $12,000,000.

* * *

W. Harry Brown, who had the auxiliary yacht Visitor II built, has ordered a new vessel with the Herreshoff Company, which will be about 150 feet long. With this yacht, which is designed by A. Loring Swasey, Mr. Brown hopes to win the Cape May and Brenton Reef cups. * * *

The three-masted schooner yacht Karina, which was built for Robert E. Tod from designs by Theodore D. Wells, is to be turned into a trader. She was last owned by the late T. P. Burgess, of Dedham, Mass.

* * *

Kingdon Gould, the youngest son of Commodore George J. Gould, has now under construction by the Herreshoff Company a yacht, which he will race next season.

* * *

The old schooner America, which has been laid up for years on the Charles River, Boston, is for sale, and patriotic Eastern yachtsmen are trying to save the winner of the famous cup from the scrap heap.

* * *

Joseph Hofman, the pianist, has purchased a 20-24-H.P. Gray engine, which he has had installed in a launch he purchased through Hollis Burgess. Mr. Hofman is using the launch at his summer home in Maine.

* * *

Some of the designs in the naval architects' offices of vessels that are to be built as soon as the war ends are most attractive. The American fleet of yachts will be finer than ever.

* * *

Vice-Commodore J. P. Morgan has been having a little yachting this year on a Herreshoff built vessel named Navette. This yacht is 114 feet long, 14 feet breadth and can make about 30 miles an hour.

* * *

Alessandro Fabbri has an auxiliary ketch named Ajax built from designs by T. F. McManus. The Ajax is 123 feet 7 inches over all, 91 feet on the water-line, 23 feet breadth and 13 feet draught.

* * *

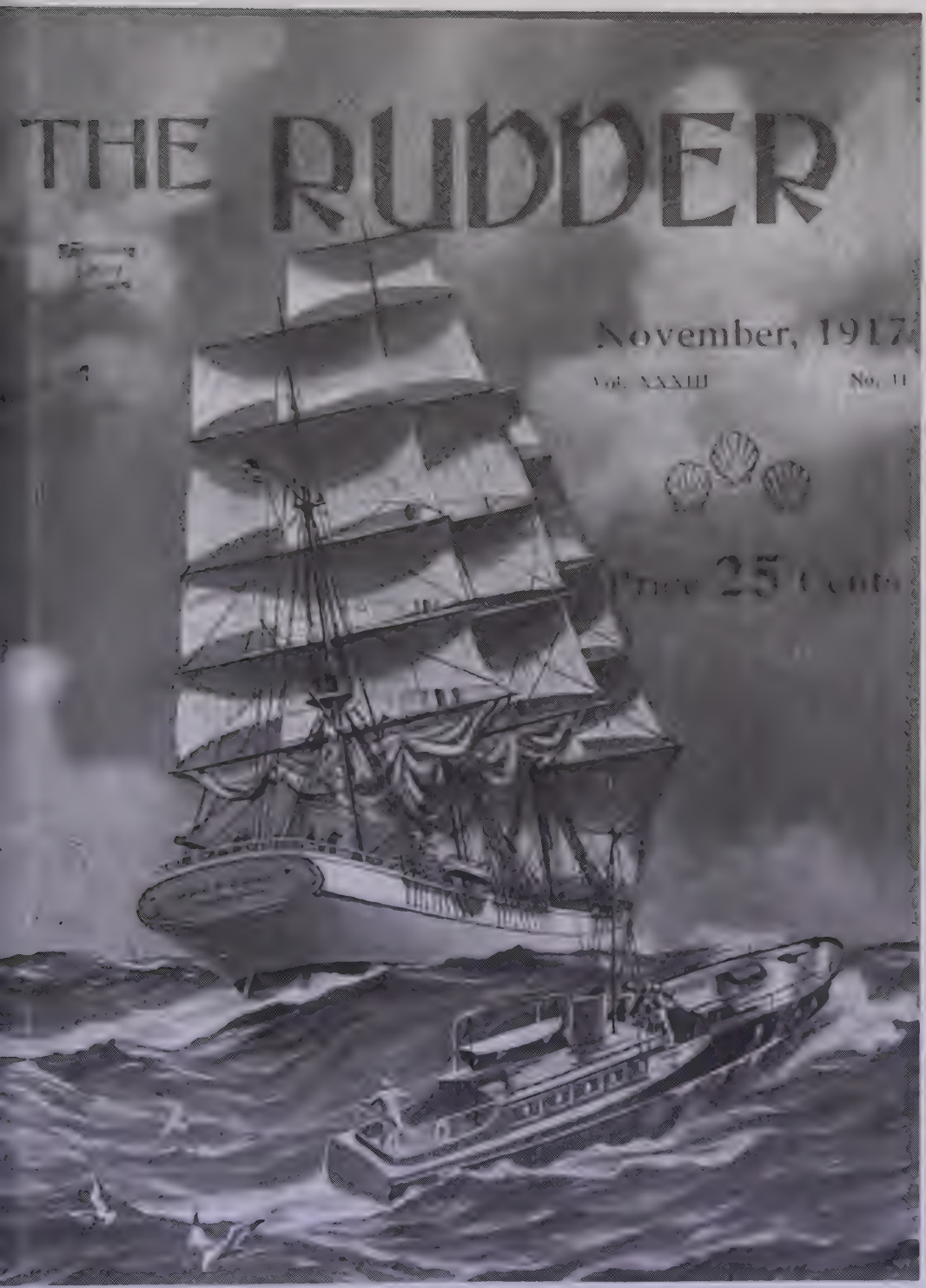
Mehleh, owned by Commodore W. R. Huntington of the Cleveland Y. C., sailed by Tim McCarthy, won the Lipton Cup which has been held at Chicago for many years. Sari, a new Alden Class R sloop, defended the cup.

THE RUDDER

November, 1917

Vol. XXXIII No. 11

Price 25 Cents





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THE RUDDER

A Magazine for Yachtsmen

Edited by Arthur F. Aldridge

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Volume XXXIII November, 1917 No. 11

Our First Battle Cruiser and Our Latest

By Walter Scott Meriwether

"I SUPPOSE," said an amiable friend as he contemplated a drawing showing how the battle cruiser Constitution will look when completed, "I suppose if we had had one of these fellows at the time of our war for independence, she probably would have been the whole show."

My friend's general nautical and naval knowledge is such that if one should have told him that the original Constitution had been a bark-rigged, centerboard schooner, armed with nickel-plated ice-picks, he would have accepted the description without comment and thought no more about it.

But his observation led into this train of thought. The senior vessel of our steel navy is the little gunboat Dolphin, built more than thirty years ago. Yet in the era mentioned even this pigmy could have swept the seas, even though they had been whitened by fleets made up of such doughty frigates as was the old Constitution, our first battle cruiser, as her steel namesake is now our latest. If in her famous flight from Broke's heavy squadron, the Constitution had possessed even one of the Dolphin's little guns, she could have destroyed all of the British frigates. Yet the Dolphin could be hoisted by the crane davits of one of the new battle cruisers, and her entire battery could easily be stowed in the bore of one of their guns and leave therein plenty of room for all shots which the Constitution could have fired in a half-dozen broadsides.

It was that line of thought which induced this comparison between "Old Ironsides" of immortal memory and 12-knots speed, and the gigantic steel construction whose 180,000 h.p. will insure her a gait of more than 40 land miles an hour. Therefore, a comparison of the bluff-bowed old frigate with the long-backed electric racer, is like comparing an ox-cart to the Twentieth Century Limited, a flint-lock to a machine gun, a boy's kite to a battle plane.

The old Constitution was admittedly the superior of every vessel of the frigate class, a superiority she proved in every action she fought. Yet the weight of her entire broadsides was but little more than the powder charge of one of the 14-inch rifles which her namesake is to carry. The weight of the Constitution's heaviest shot was 32 lb. It would require almost forty of these to equal the weight of a 14-inch shell. While the range of the heaviest gun carried by the old frigate was less than a mile, that of the heaviest gun of her namesake is more than twenty-five times as great.

The weight of the frigate's heaviest gun was 5,600 lb; the weight of the 14-inch rifle is 63 tons. The guns of the frigate were mounted on wooden carriages, the recoil being checked by heavy ropes. The recoil gear of the 14-inch rifle must absorb a shock equivalent to that of ten Pullman coaches running at 70 miles an hour and brought to an instant stop.

The guns of the old Constitution were incapable of piercing armor at any range. The 14-inch rifle pierces 50 inches of wrought iron at the muzzle and at a range of 9 miles its shells have cut through 16.7 inches of Krupp steel. The muzzle velocity of the old guns is not known, as no measurements were taken in the brave days of yard-arm to yard-arm battles. The scientifically measured velocity of the 14-inch gun is 2,600 feet a second. If the shell could maintain its initial velocity, in four and a half days it would travel a distance equal to the span from earth to moon.

In the matter of muzzle energy a still more striking comparison can be had. The muzzle energy of a 14-inch rifle is 70,000 tons. Therefore, a broadside from the new Constitution would have a total muzzle energy of 700,000 tons, a force sufficient to lift the old Constitution 350 feet in air. If the old frigate could be stood on end and placed alongside of New York's City Hall, she would about measure up to the top of the

cupola. If the new Constitution were up-ended alongside the Woolworth Building she would tower so far above that Gothic pile that if the City Hall were placed on the apex, the combined height of the two would not equal the majestic length of the battle cruiser.

With the wind on the quarter and blowing strong, which was the Constitution's best point of sailing, the old frigate could reel off about 12 knots an hour. The new battle cruiser is designed for a speed of 35 knots, almost three times as great. To attain this pace, which is 5 knots in excess of any foreign-built vessel of the same type, it was found necessary to endow her with 180,000 h.p., which is two and a half times greater than was the motive power of the Lusitania and twice that of the Imperator. To secure the high speed contemplated in this design, the hull of the Constitution and her class will show a run as fine if not finer than that of any destroyer. Oil fuel stored in the double bottom will take the place of coal bunkers and this will generate the electric energy which is to propel the cruiser at the express speed of 40 land miles an hour.

An odd feature of the Constitution will be the number and arrangement of the smokestacks. There are to be seven of these, five grouped in the form of a five of diamonds, with another directly forward of this group and another abaft of it.

The ten 14-inch rifles of the main battery are to be mounted in four turrets, two of the turrets carrying the triple mount, the other two carrying their guns in pairs. A battery of twenty 5-inch rifles will provide defense against torpedo attack. There will be three anti-aircraft rapid-fire guns, and eight torpedo tubes for firing the new 21-inch torpedo, which has a range of 10,000 yards.

When half of the million men that were to "spring to arms between sunrise and sunset" have been gathered to the colors, they will, in course of time, be provided with a half-million muskets. A battle cruiser of the Constitution class represents in herself a greater weight than this half-million men, while the muzzle energy of her armament is greater than the combined energy of a million muskets. Moreover, the Navy officer who commands one of these battle cruisers can move this dynamic force at fifteen times the marching speed of a half-million men, and can exercise over his command a control absolute as that the Kaiser maintains over his army.

Every great war of recent years has developed some new type of fighting craft. Out of the Civil War came



Constitution as She Now Is at the Boston Navy Yard



The New Constitution as She Will Look When Commissioned

the monitor, forerunner of the battleship, which is but an enlarged monitor with higher freeboard, greater speed and more numerous turrets. Next came the dreadnought, also aftermath of conflict. It has been popularly supposed that Great Britain, as Japan's ally in her war with Russia, had received from her ally the first informative word of the result of the naval battles in the East, and that as a consequence her constructors had been the first to evolve the idea of the all-big-gun ship, otherwise the dreadnought of today. But it is a matter of record that plans for this type of vessel had been drawn by our own progressive Navy officers immediately after the battle of Santiago, and that these plans were the direct result of the lessons learned in that battle.

Previous to the outbreak of the present war, one of Great Britain's Sea Lords, Admiral Lord John Fisher, realizing the value of powerful gun-fire when joined to extraordinary speed, managed to smuggle into the Admiralty's building program provision for three vessels having these qualities, these being the fast and heavily armored cruisers of the Indomitable class, the "mystery" ships as they were known at the time because of the great



Old Ironsides With All Her Canvas Set. (Photo From an Old Painting)

secrecy which attended their construction. From this type was evolved the superb battle cruisers of which the world has heard so much of late.

Some of the progressive officers of our own Navy had long ago foreseen the imperative need of vessels combining great speed with hard-hitting power, but it was not until more than two years of war had demonstrated the incalculable value of this type that Congress consented to authorize the construction of the six battle cruisers for which bids were recently asked. It was a notable departure from precedent, as for many years the average speed of our war fleets had been much lower than that of any other fleet, and no effort had been made to strengthen it by the addition of faster vessels.

But no converts like new converts, and in the matter of extraordinary speed, enormous size, great battery power and new method of propulsion, the projected battle cruisers are of the most novel and advanced type of any vessels designed for any navy since the British dreadnought revolutionized naval construction. Electricity generated by oil fuel was chosen as the motive power, the reason being that the amount of coal which would be required to drive one of these cruisers at full speed for one day would be sufficient to drive the biggest liner across the Atlantic and back.

The battle cruiser is actually nothing more than a battleship with armor and gun power sacrificed to higher speed. In this evolution some see an analogy between the constructive work of man and the processes of nature.

"Geological records," Commander Yates Sterling tells us in his "Fundamentals of Naval Service," "show the gradual elimination of purely defensive adaptations of the body in animals. The turtle family, the scaly Saurians, were purely defensive types. These gigantic but slow-moving quadrupeds have failed to survive. They have been unable to withstand the attacks of those animals in which mobility and the power of combined action have been predominant. Surviving types as a rule contain a happy balance of those offensive attributes, activity, endurance and intelligence, translated into claws and teeth, limbs and muscles, and an hereditary instinct to combine in packs for the attack upon a more powerful foe.

"Nature is a faultless organizer, yet even she arrives at perfection only through a selection of organs essential to an environment. Man unconsciously follows nature's methods, but only in a rambling and uncertain way, which requires a longer time to arrive at a result desired.

"On land the soldier protected his vitals with armor. In the days of stones and arrows fighting men wore hides and furs for protection. When the gun came into use he covered himself with a coat of steel mail. This he wore until the increasing penetration of the bullet caused him to be so overburdened with armor that he could not stand or walk under his great load. Then he discarded armor and at once regained his activity and endurance.

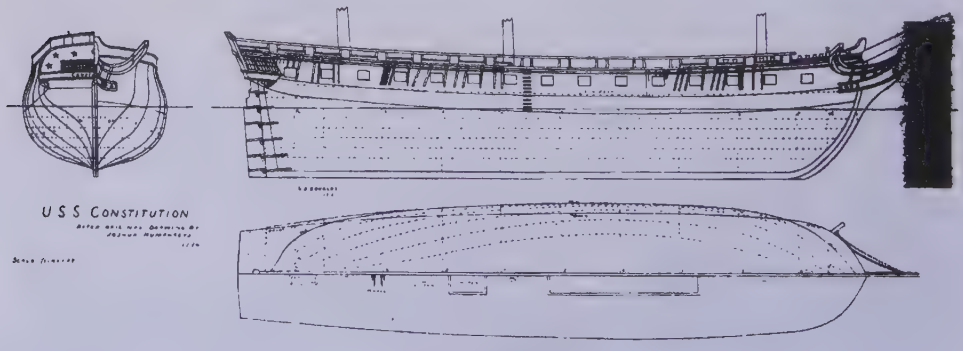
"Why should not our armored dreadnoughts follow these laws?"

The projected fleet of lightly armored vessels of enormous speed and heavy batteries now provides the answer.

Two of the battle cruisers are being constructed by the Newport News Shipbuilding & Dry Dock Company, one by the New York Shipbuilding Company, of Camden, N. J., one by the Fore River Shipbuilding Company, of Quincy, Mass., and one by Government workmen in the Philadelphia Navy Yard. Each vessel will be equipped for carrying and launching the largest type of hydroplanes.

OUR FIRST BATTLE CRUISER AND OUR LATEST

Description	Frigate Constitution	Battle Cruiser Constitution
Length	175 Ft.	874 Ft.
Breadth	43 Ft.	91 Ft.
Displacement	1,576 T.	34,800 T.
Speed	12 K.	35 K.
Complement	450	1,274
Cost	$302,719	$20,500,000
Weight of broadside	338 lb	15,200 lb
Range of heaviest gun	1,800 Yds.	25 M.
Penetration of armor at 10,000 yds.	Nil, at all ranges.	16.6 In.
Weight of heaviest projectile	32 lb	1,400 lb
Weight of heaviest charge	8 lb	365 lb
Weight of heaviest gun	5,600 lb	63 T.
Cost of heaviest gun	$300	$60,000



Lines of Old Ironsides

A Visit to the New Bedford Whalers

By George B. Douglas

I HAD long wanted to take a trip to New Bedford and see the whaling vessels, and the new model of a whaler that had been built in the museum. So one day last August I took the boat from New York and was up early in the morning when we were entering New Bedford Harbor.

I had read that a whaler had recently arrived in port and was delighted when I saw a schooner with the well-known crow's nests and davits of a whaler anchored in the harbor, and when the steamer neared the wharf there were three bark-rigged whalers at adjoining piers.

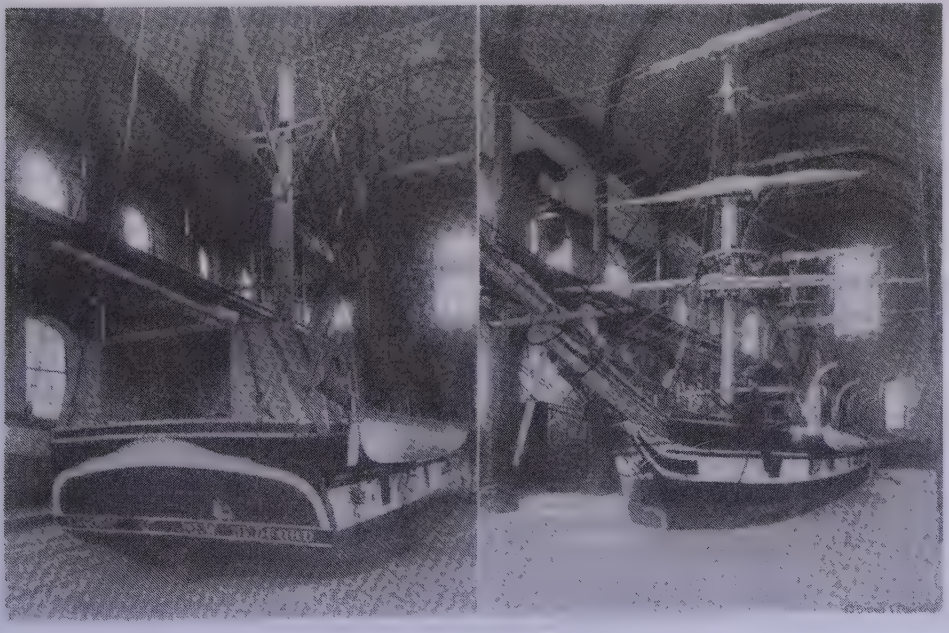
After getting rid of my suitcase at the hotel and meeting Mr. A. C. Church, I took my camera and started for the wharves.

Our first visit was to the Viola, a brigantine of 139 tons, that had arrived a few days before with about $70,000 worth of oil in her hold. I took several photos on board, but except for her try works and the fact that they were pumping oil from her tanks into barrels on the wharf, there was nothing unusual about her. Across the wharf was the bark Greyhound, getting ready for a cruise, with the riggers up aloft bending sails. Here was the real thing. This vessel was 95 feet long between perpendiculars, 24.4 feet breadth, 12.2 feet depth of hold and 169 tons net. She was built in New Bedford in 1851 and was still as good as ever. I took several photos and roamed all over her deck and down in the after cabin. I should have liked to have gone down in the crew's quarters forward, but they were cleaning it out and it did not look very inviting.

Ahead of the Greyhound was the schooner John R. Manta, of 98 tons net, that I had seen out in the bay. She was the usual type of Provincetown fishing schooners and had about $10,000 worth of oil and some nice lumps of ambergris on board.

At another wharf the bark Wanderer, of 288 tons net, was fitting out. She was built in 1878 at Mattapoisett, Mass., and has much finer lines than Greyhound. On deck, however, she was much the same.

At another wharf was the bark Bertha, of 168 tons, an old whaler, 99 feet long, built in 1898. She had her sails bent, and was getting ready for a trip to the Azores for "Black Ivory", a term used for colored Portuguese men, who make up the crews of the whalers, and quite



Views of Model of Whaling Bark Lagoda

Stern View, Showing Trying-Out Works — Bow View



Bertha, Whaling Bark, Built in 1877, Just In With Oil

a few of them are on the fishing schooners. I also understand that many of them are shipped out to Honolulu to work on the sugar plantations.

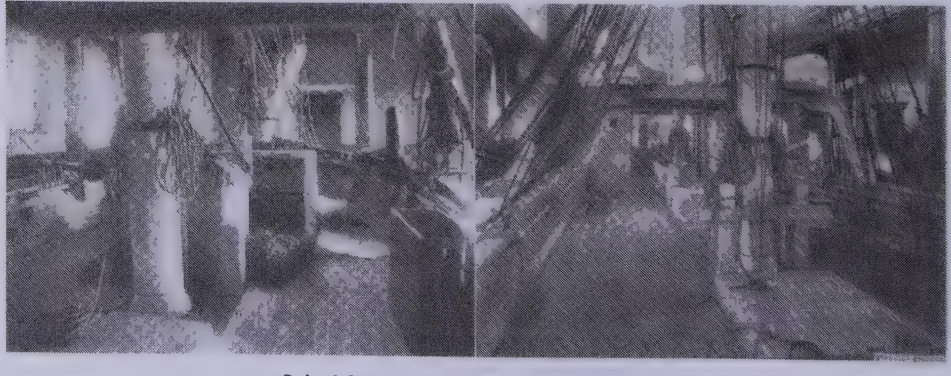
The next day I visited the Jonathan Bourne Whaling Museum, which is an annex of New Bedford's Old Dartmouth Historical Society. Miss Emily Howland Bourne, daughter of the great whaling merchant, in memory of her father, had presented to the museum a half-size model of a whaling bark called the Lagoda. She stands on the floor of the museum, perfect in every detail from a foot below the copper to the Bourne house flag at the main truck, a permanent memorial to the whaling industry and all that it means.

The model is 55 feet long on water-line, 13 feet 6 inches breadth, 82 feet from end of bowsprit to end of spanker boom, and 48 feet 6 inches from floor to main truck. The plans were drawn in 1915 by Messrs. C. Hammond & Son of New Bedford and carefully worked out from measurements and photos taken on board of a typical whaler then lying in port, that was built in 1841 and is still in service. To work out a model of this or any other kind, you must be exact, for it isn't the criticism of a casual summer visitor you fear, but what some old "sea-dog" will say that has spent years on a whaler. They have an old whaling captain as caretaker of the model, and you may walk on the floor as if you were walking on the water and examine the hull and rigging and go on board by way of a regular side ladder as though going on board from a rowboat.

On deck you will find every rope, rowboat, whaling gear, lances, windlass, etc., in its proper place, and in perfect order. You will find the starboard rail removed and the platform rigged out just as it would be if they were working on a whale alongside the ship. The try works, set in brick work on deck, with kettles, scoops, etc., are all ready to light the fires and start the work of trying out the oil. The caretaker will tell you just how they go through the different operations and show you the tools, tackles, etc., that they use.

If you lift up the main hatch, you will find some oil barrels down in the hold, and if you go aft and visit the curious after house you will find the galley with its stove, etc., and the companionway that leads to the main cabin on the lower deck. The man who devised the way of showing the cabin was a genius. As the real cabin on a whaler would have only 7 feet headroom, and to make it half size would give about 3 feet 6 inches headroom, visitors, naturally, could not go into it, so they placed the floor you walk on 4 feet below where the deck of the cabin comes, painted the side walls of this space a lead color and the real cabin white. You can, therefore, walk around in the main and captain's cabins, open the doors to the staterooms, etc., see the little bunks with their pillows and blankets, the dining table, hair-cloth sofa, dish-racks, etc., at your ease.

Messrs. Hammond & Son kindly gave me a set of



Deck of Whaling Bark Looking Forward—Looking Aft



Briggs & Beckman's Sail Loft, Only One Left in New Bedford



Whaler, Greyhound, 95 Ft. Long, Built in 1861

the blue prints of the Lagoda and Mr. Church a half-model of a typical whaler. From these and as the result of my visit to the ships I have worked out a set of plans of a typical whaler, and I am sure they will interest many of the readers of THE RUDDER, for many of us have no doubt read stories about whalers, such as the "Cruise of the Cachelot" and others too numerous to mention, and have wondered what kind of a vessel a whaler really was. We can get the "Real Story of a Whaler," by A. Hyatt Verrill, from the library and read that, but that does not tell us what a whaler looked like under water, or the detail of the rig, or the cabin or the try works. Whalers are not intended to make speed—some of the yachting sharps, looking at the lines, will say "What a midship section!" but a whaler will say,



Bending Sails on the Greyhound



Old Whaler Preparing For Another Voyage



Try Works on Whaling Bark Wanderer



Deck of Whaling Brig Viola, Showing Windlass

"What a fine vessel to stow barrels in!" So you see "it's all according to taste," as the old lady said when she kissed the cow.

Only one of the New Bedford sailmakers still exists, Briggs & Beckman, and their lofts are busy places these days.

Stories of the whalers have always had a fascinating interest for all lovers of the sea. The thrilling experiences of these hardy seamen have been told often and now it is possible that more of these yarns will be penned. The old whalers are not to die even if modern methods have supplanted them.

Whaling may be said to have begun when the Pilgrims settled in Massachusetts or soon after that. The early settlers found that the whales so abundant off the New England Coast would be sources of great revenue and



Pictures of Whalers Taken by George B. Douglas

Head of Bark Greyhound
Deck of Brig Viola

Bark Greyhound Fitting Out
Head of Bark Wanderer

many of the towns that are now flourishing were originally settled by whalers. Among these may be mentioned Bristol, now the home of the Herreshoffs; Newport, the center of wealth and fashion on the coast; the island of Nantucket, Southampton, Sag Harbor, and New London. In 1644 Southampton on Long Island was divided into four wards of eleven persons each, whose duty it was to secure and cut up the whales that came ashore. There were no whaling boats in those days and the whalemen had to depend on their small craft to chase and capture the whales. In 1688 the Happy Days, a brigantine owned by Timotheus Vanderuen, sailed from Boston for the Bahamas in search of sperm whales. This was the first vessel to start off on a whaling cruise. Very soon other vessels followed the lead of the Happy Days and swept the Atlantic, bringing home many barrels of oil. In time New Bedford became the center of the whaling industry and now, while whaling is nothing like it used to be, this town is full of interest to those who are fond of the stories of the whalers and the Old Dartmouth Historical Society is a permanent museum of whalers and whaling.

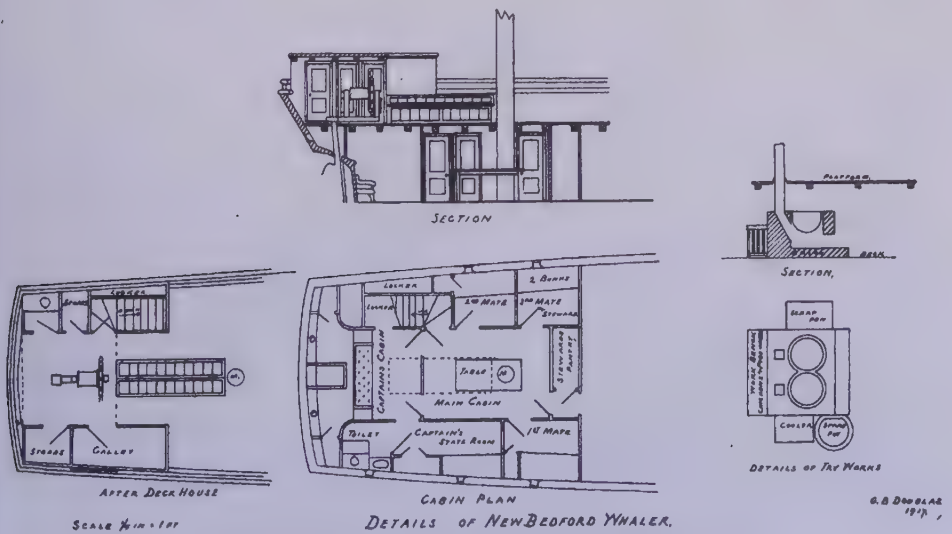
There are many other relics to be found in the town. The old candle factories, the blacksmith shops where the lances and harpoons were made, and the yards where the boats were built still stand. There are some old shops where the curios of the whalers can still be purchased. The museum has thousands of ornaments, implements and odd things carved from whales' teeth and the tusks of the walrus. These were made by the sailors while on their cruises and sold when they returned home. There are models of whaling vessels made by the sailors, paintings and drawings of famous vessels, logs and journals, lances, spades, guns, harpoons, figureheads and other things that were used in the industry.

"The Real Story of the Whaler," a book written by A. Hyatt Verrill, gives some interesting figures of the rise and fall of whaling. It tells that there are as many whales in the ocean now as there ever were and that the seas have not been fished out, as many say. Whale oil, which in the fifties sold for as high as $2 a gallon, fell as low as 50 cents; but the war has caused a rise in the price and because the demand is increasing and the value rising some of the old ships that have been laid up for years have fitted out for sea again.

Up to December, 1823, the largest cargo obtained in a three-years' voyage was 2,600 barrels, valued at $65,000. In 1830 the Sarah, of Nantucket, brought home 3,497 barrels, worth more than $89,090; in 1850 the Coral returned with 3,350 barrels, worth $126,630; in 1911 the Cameo brought home 4,000 barrels, which were worth only $50,000. Then, too, the cost of whaling has increased like everything else. The average cost of fitting a whaler for a two-years' cruise in 1790 was $12,000; in 1858 it had risen to $65,000, and today the cost is about $150,000.

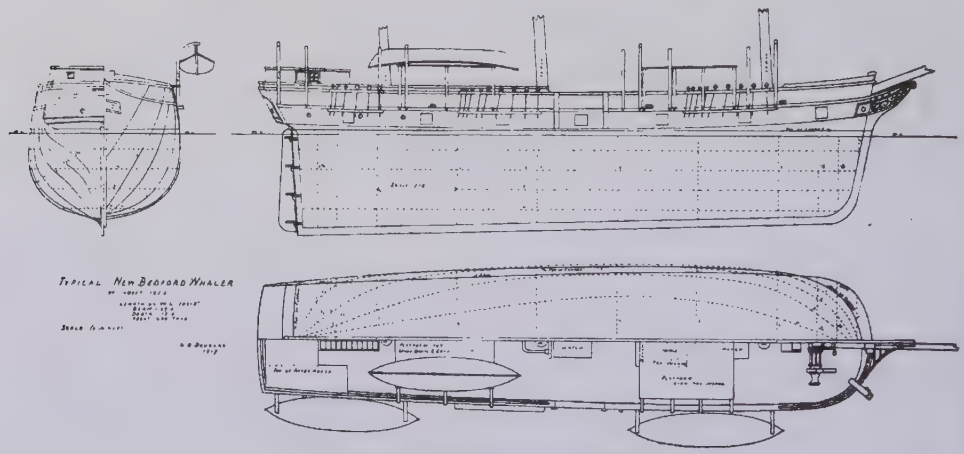
Whaling was at its height of success in 1850. In that year 736 vessels returned to New England ports with 14,744 barrels of sperm oil, 39,215 barrels of whale oil and 894,700 lb of whalebone. In 1851 New Bedford boasted of having 314 vessels in the whaling industry. More than 10,000 men were employed, and in one season 10,636 barrels of sperm oil, 86,451 barrels of whale oil and 601,100 lb of whalebone were taken into New Bedford.

Whaling has had its ups and downs like everything else. The first real setback was in 1741, when French and Spanish privateers destroyed many of the whaling vessels of the English colonists. After recovering from this setback came the war of the Revolution, during which the whaling fleet was reduced from 360 to 80 vessels. After peace the industry revived and the brig Bedford, American manned and American built, was the first vessel to fly the American flag in a British port. This was in 1787. Many vessels were lost in the French war and again in 1812 many more were captured or destroyed.

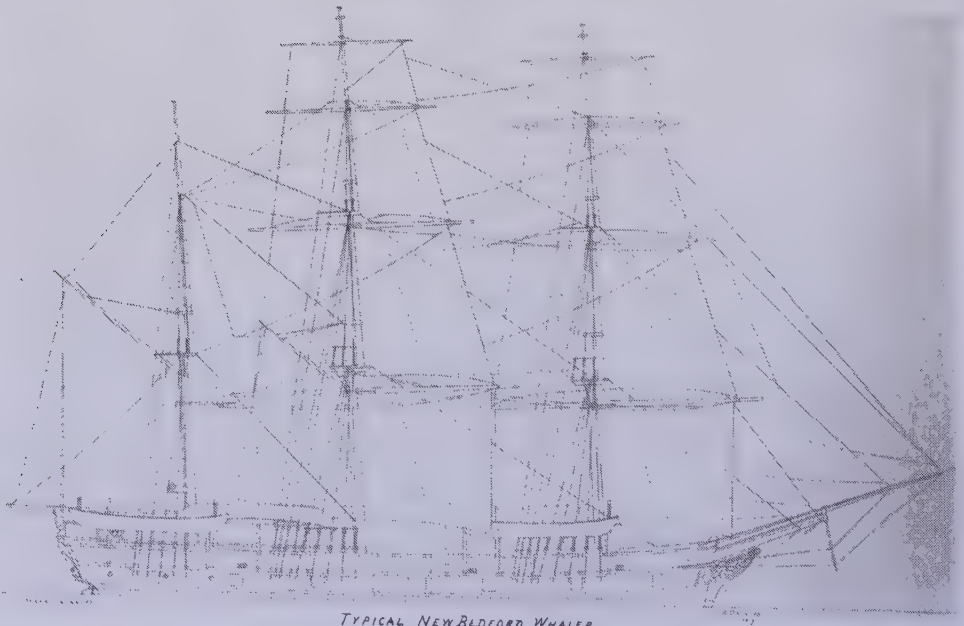


After that things boomed until the Civil War, when many vessels fell easy victims to the cruisers and privateers of the Confederates.

Now the romance of whaling is almost gone. New Bedford, built through the whalers, is a busy manufacturing town. A few of the old ships are to be found there and a few still follow the whalers' calling. Whaling is, however, still carried on in other parts of the world, but the methods are different. Steam vessels are used. Swivel guns hurl the harpoons and lances at the whale and the carcass is hauled to some beach, where it is stripped of blubber and the flesh and bones are converted into fertilizer. Modern appliances have changed everything.



Half Deck Plan and Longitudinal Lines of a Whaler



Yachting of the Year

NATURALLY this has been an off year for yachting. With the war yachtsmen generally dropped their pleasures and a great many by enrolling in the Navy put into practical work what they had learned of navigation and boat handling. Thousands of yachtsmen are now serving their country, helping to bring the war to a successful termination. All the yacht clubs abandoned their racing programs early in the year but later some arranged for certain races, and the sport has been continued but on a small scale compared with former years. At first everyone thought that all pleasures should be abandoned but wiser minds showed that this would be poor policy, and the urgent request of President Wilson that sport should not be dropped had a stimulating effect.

With the exception of some of the more important of the power-boat races, such as the Gold Cup, the Thousand Islands Cups, the racing on the Delaware and New Jersey Coast and some of the smaller sailing yacht races, such as the Put-in-Bay Week, the Lipton Cup off Chicago, the catboats at Barnegat and some of the smaller classes on the Long Island Sound and in Eastern waters, the sport has been very informal in its character. At the same time it has been good, instructive and entertaining.

The most important class that has been in commission of the sailing yacht fleet has been Class O, the one-design 38-footers built for members of the Larchmont Y. C. Six of these yachts were built by Wood & McClure at City Island from designs by William Gardner and five were put in commission. They have kept in home waters and sailed eight informal races off the Larchmont Y. C. Of these eight trials, Varuna, owned by Commodore James B. Ford, won six, and she was beaten in the other two through slight accidents. In one she split her mainsail. The Varuna carries what is known as a Marconi rig while the other four are rigged in the regulation way with gaff mainsails. This Marconi rig was an experiment. The owners of these yachts agreed that one yacht should try out this rig and carry the rig throughout the season in order that it might be thoroughly tested under all conditions of wind and weather. The Marconi rig has proved its worth, but the margin between the two types is very small. Now that the yachts have been laid up the experts will take the



© Edwin Levick

Larchmont 38-Footers Racing in a Good Wind. Nimbus Leading at Captains Island Buoy, Followed by Georgia and Varuna

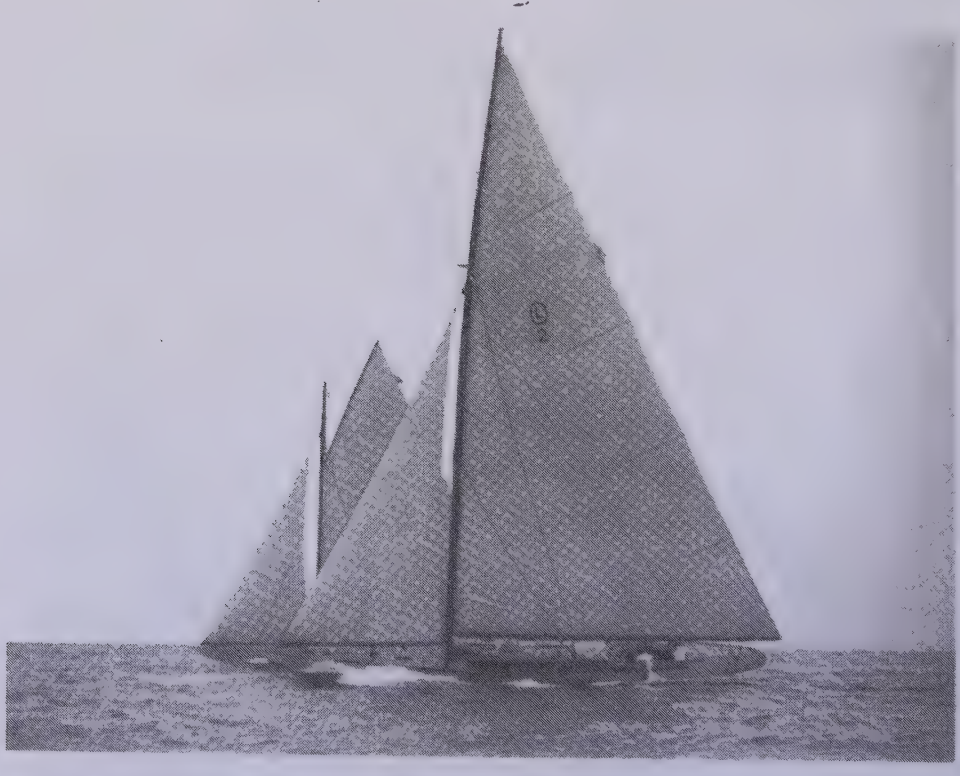
figures as gathered from their performances and will in time tell us that the result of their scientific calculations show just what the change is worth.

On the Sound several yachts of the Handicap Class sailed a few races and generally these races were favored with good weather. In some races the winds were fresh and the photographers were able to obtain some very attractive pictures, which are a relief after seeing so much of patrol scouts and war vessels.

The Stars, of course, had a busy season. They sailed races in all weathers, and probably the most important was that from Port Washington to Captains Island and return. This long race was won by Little Dipper, owned by George A. Corry, and as three boats are now tied in the point score for the final possession of the silver cup, it will be settled in the next race. The Stars are going everywhere. They have raced on the lakes and are now getting into foreign waters. When the war ends it is probable that the Star Class will be the best known and the most popular among yachtsmen of all nationalities.

At Oyster Bay the Fish one-design yachts sailed regularly week-ends, and at Stamford the one-design class was raced. At Indian Harbor the Arrow Class furnished fun for the members of the club, and at Bayside the Birds, Stars and other classes were in regular competitions. And so it was all along the coast. The small yachts were sailed in club regattas, thus keeping the sport alive.

Last Winter plans for a small catboat, designed by F. W. Goeller, Jr., were published in THE RUDDER. The original design was named the Sea Mew. This catboat, which could also be rigged with jib and mainsail, was intended for the younger generation. It was a boat safe and staunch, easily handled and large enough to carry several in its cockpit. Many of these boats have been built. There would have been more but for the war. Yachtsmen of the Great South Bay had planned to have a class for the boys or girls to sail. In other localities there would have been classes, but the war upset all plans. Isaac Smith, of Port Washington, built several for members of the Harlem Y. C., and these have been raced and have given such satisfaction that more will be built during the coming Winter. The photographs printed herewith of some of the Harlem Y. C. boats show what sturdy craft they are, and every



Georgia and Varuna in Close Company Reaching From Glen Cove to Captains Island in Last Race of the Season © Edwin Levick



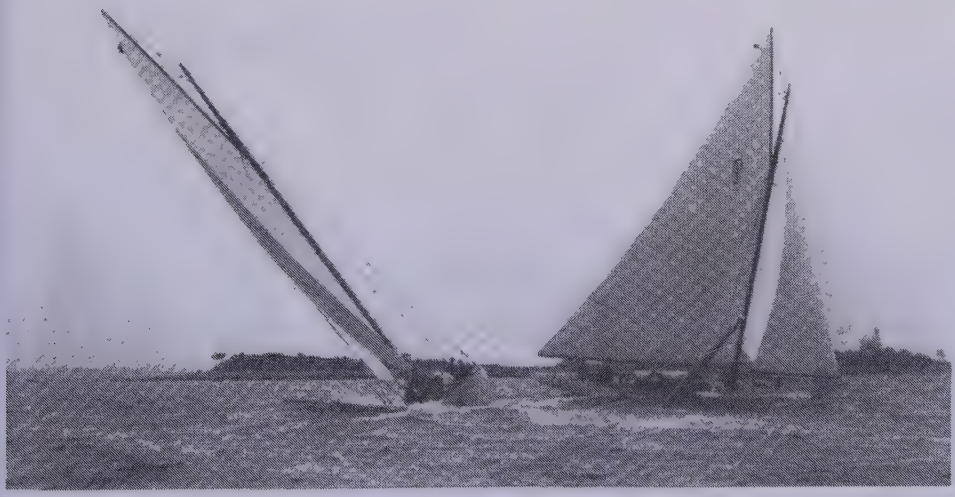
Sea Mews (Left) and Morrisania Catboat (Right) in Race Off City Island

man who has sailed on one is enthusiastic about the class. Some slight changes were made in the boats after they had been tried but these were very trivial. It was found, however, that a weighted centerboard was necessary.

Edward J. Clark, a Lake yachtsman who had one of these boats built by the Jensiek Boat Company at Grand Rapids, had a steel board put in place of the wooden one. He is delighted with the boat and says he would not change for a weighted board under any consideration. The spars of these boats were made by the Outing Boat Company at Fond du Lac and the sails by George B. Carpenter & Co., of Chicago.

Another one-design class of catboats was built by Morrisania Y. C. members. These were designed by Edward de Levante and have given great satisfaction. There is a keen rivalry between the owners of the two types. Unfortunately THE RUDDER containing the plans of the Sea Mew has been completely sold out. There have been many requests for the plans and so they are published again in the section devoted to plans.

In Eastern waters there has been considerable sail-



Nimbus First at the Captains Island Mark, With Georgia Almost Ready to Turn

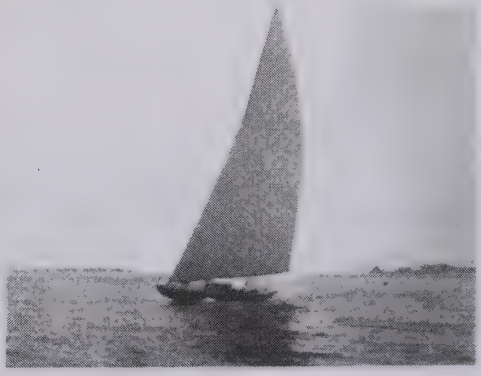
© Edwin Levick

ing and racing of an informal kind and as usual Marblehead has been the center of much of this. Frank C. Paine, youngest son of the late General Charles J. Paine, is now a member of the Eastern Y. C. He has sailed the 31-rater Stranger which he purchased early in the year and has done very well with that yacht against such other Class P sloops as were in commission. Some of the yachts of the smaller classes tried out the Marconi rig and their owners are well satisfied with the results as far as they have been able to figure them out. One of the boats so rigged was Fred M. Hoyt's sonder Skeezix. This boat is only 20 feet on the water-line and those who remember the sonders when at the zenith of their popularity will be surprised to see Skeezix with a lofty spar and Marconi mainsail. She sails well under her new rig.

Although the racing was good in Class P and Q, the best sport was had in Class R 20-rating, in which five boats started in nearly every race. The new Rogue, designed by John G. Alden for Charles E. Adams, was an easy winner, finishing first in six out of the eight races sailed and obtaining a second and a third in the other two. Her principal competitors were last year's champion, the Huskie, and the Timandra (ex-Banshee), which won the other two races.

The Timandra, the second boat, another Alden production, was champion of Lake Michigan in 1915-16, and this year was brought on from the Lakes and raced by Vice-Commodore J. B. Fallon, of the Corinthian Y. C.

The racing in Marblehead waters in this class promises to be most successful next Summer and several new boats are contemplated. The boats vary from 22 to 25 feet water-line and carry the snug rig of about 575 square feet of sail.



Skeezix, F. M. Hoyt's Sonder, With New Marconi Rig

The standing of the different boats, according to the Massachusetts Bay percentage system, without penalizing any of the boats for non-starts, is:

Boat and Owner	$
Rogue, C. E. Adams	.925
Timandra, J. B. Fallon	.507
Beta, C. H. W. Foster	.478
Huskie, J. F. Duryea	.357
Jack Tar, H. A. Morss	.308



Sea Mews, Built From Rudder Designs, Racing Off Harlem Y. C. at City Island. (Plans of These Boats Are in the Section Devoted to Designs)

The Season in Southern Jersey

By J. Kinzer Shell, Jr.

PERSISTENCY of effort, in an endeavor to obtain desired results in drawing to a successful conclusion any form of enterprise undertaken, has always been an axiom of leaders in the business world, the field of sports, and other lines of venture. It has been conclusively shown that, unless there is a full-hearted effort put forth with a continuancy of the plans formulated to the ultimate end, success will not be obtained. There should be no letup along the lines to be followed, and a set purpose must be in mind to see the object under consideration reach its conclusion in a satisfactory manner. Obstacles will and must be encountered in order to obtain the desired results. Men and things have succeeded when such a policy has been followed, and there has been no letup on the set purpose in view.

It has always been the desire of those yachtsmen in the sections comprising the Delaware River, the South Jersey Coast from Atlantic City to Cape May, and on the waters of Barnegat Bay, who are interested in yachting, to place their divisions in the forerank, and at the same time to continue the promotion of the sport until it is considered one of the stellar lights in the firmament of athletic pursuits. The men at the helm of piloting the sport in this vicinity and New Jersey on the long way to success have constantly been driving against the storms of criticism, the manner of competition by which results for or against the advancement of the sport are shown and constantly changing type of racing craft. Despite the adverse conditions, a glimmer of hope started to appear prior to the 1917 season and it was almost apparent that the labors of persistency would bear fruit and success would be obtained.

Arrangements had been completed the past season for what was thought would be the most successful year in the history of the sport since its inception into the limelight. But breakers showed up off the bow of the flagship of the leading organization in the shape of the impending war between the United States and Germany. Everything was apparently being left to chance, and a turn about for harbor was expected on orders from the captain of the undertaking and shelter sought. However, after a hasty and lengthy consultation of those in charge of the flagship, orders were given for procedure along the same lines as followed in previous years, with provision made for actions which would be taken by the Government in relation to the commandeering of ships and the closing of traffic to pleasure craft.

With a set purpose in view as to what must be accomplished in order to continue previous successes and not let the sport die, in what might be termed its infancy, those in charge kept to their course, and as a result the season of 1917 in the three sections of Delaware, Southern New Jersey and Barnegat Bay, was as much a success in relation to competition and interest manifested by the followers as in previous years. Of course there were certain curtailments of racing events, which were necessitated by the actions taken by the War Department, but these were, however, overcome by the changing of course and dates best suited for competition. In only two instances were there reasons for cancelation of dates and programs arranged, and these were due to strict adherence to the orders of the War Department.

It is generally understood when giving a review of an enterprise to state in as positive terms as possible just what success was really attained, without making any



© J. N. Pearce

Sarah Jane, W. C. Handlan, Owner, 55 Ft. Long, a Consistent Racer in South Jersey Waters. A Sterling Engine of 120-170 H.P. Has Won For Her Owner Many Prizes

attempt to change anything which would prove a detriment to the facts cited. Therefore it can be safely said, without hiding anything, that the racing in the three sections mentioned was far more successful than was first expected. It attested to the fact that interest was by no means lacking, and competition was just as keen as in previous years. More boats of the various types were in competition than heretofore. The racing rules in a general manner were not given the thorough test as was expected by those who embodied them, but they however made the races for the most part closer, and settled several points in question.

The yachtsmen on the Delaware River and along the shores of New Jersey, from Bay Head to Cape May, were not so hasty in their actions in the cancelation of racing dates as was displayed by the powers back of other athletic activities. Every effort was made to keep the interest alive. The regatta committees of the various organizations did not wait for the owners of racing boats to come to them to enter competition, but went after them in a manner never displayed before, and therefore there were more boats competing than heretofore.

The original schedules made up previous to the declaration of war between this country and Germany were adhered to as far as possible. When a change was necessary, there was no calling off of the regatta under consideration, but a later or earlier date set, the course changed, and every effort put forth to hold the event. In but three instances was there a race dropped or an affair planned canceled due to the war. The first event, which out of necessity had to be given up, was the annual cruise of the Delaware River Yacht Racing Association, scheduled to be held on Chesapeake Bay. The route would have carried the fleet through the Delaware and Chesapeake Canal, which was closed to all traffic of pleasure boats by the War Department.

The fourth annual race for the Coxe-Hall Trophy from the Corinthian Y. C. of Cape May to Five Fathom Bank Light and return was canceled, due to the restrictions placed upon boats going to sea, and this of necessity canceled the intended cruiser race for the championship of the Delaware River from Camden to Cape May. However, the Delaware River event was changed to a later date, and was held on the upper stretches of the river, for there was a restricted area placed on the Delaware from Peapatch Island to Breakwater. The annual Barnegat Bay championship regatta, which had become a feature in power-boat annuals on the Jersey Coast, was called off due to a misapprehension on the part of officials not really in charge of affairs, and accomplished before the chairman of the regatta committee was aware of the situation.

With the exception of the events mentioned, the four organizations interested in the advancement of yachting

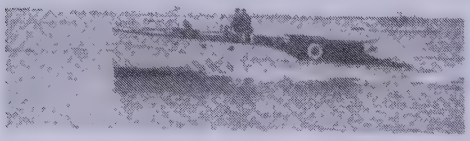


Hilda, E. L. Myers, Owner, 33 Ft. 8 In. Long, 8 Ft. Breadth, Powered With a 3-Cyl. Frisbie Engine of 18-25 H.P. A Consistent Winner on the Great Lakes

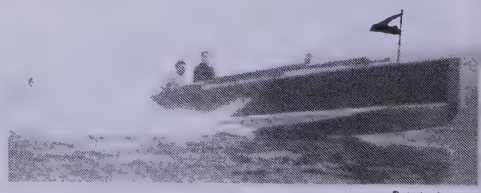
and power-boating went ahead with the arranged schedules, and held the events. Due to the larger number of clubs and more racing boats, the Delaware River was the scene of many spirited race-meets. The dozen or more clubs making up the Delaware River Y. R. A. were well represented in the races held, while the six clubs composing the Delaware River Yachtsmen's League were not far astern in regard to the competition and the interest displayed. Four of the five regattas scheduled to be held under the auspices of the clubs of the South Jersey Y. R. A. took place. Only on Barnegat Bay was there no power-boat racing, but those interested in the game, however, made up in a good measure by showing added interest in the racing of sailboats of the various types.

The competition on the Delaware River was confined to the upper stretches, as a restricted area had been placed upon the waters by the War Department. Several races had been scheduled to be held to Ship John Light, Overfalls, to Cross Ledge and other points South of Peapatch Island, but these had to be rerouted. The clubs from Trenton to Wilmington were actively represented in all of the races held, they traveling from one section to the other in order to participate.

With the exception of the four race-meets of the Delaware River Yachtsmen's League, the events were entirely for cruisers. In the League race-meets there were events for the open boats and the glass cabin craft. The cruisers predominated during the season. However, with all of the events held, the racing rules adopted for the cruisers were by no means given what might be termed a fair test, for the conditions and other things which would have tended to have them prove satisfactory were lacking. The racing rules called for cruisers to go to sea whenever possible where rough weather would be encountered and the boats compelled to display their best racing qualities. This, however, could not be done



Mary Jane, a 40-Foot Cruiser, Owned by J. M. Rowland; Equipped With an 8-Cyl. Sterling Engine; Speed 28 M.P.H.



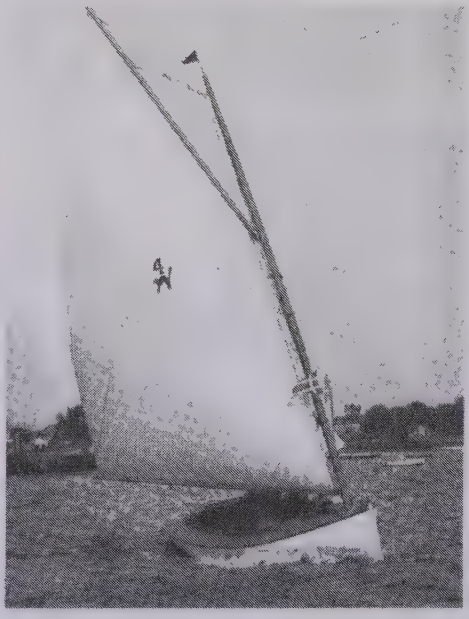
J. M. R., J. M. Rowland, Owner, 26-Foot Runabout, Designed by A. W. Crouch; 4-Cyl. Sterling Engine; Speed 34 M.P.H.

and the racing being confined to the upper stretches of the Delaware River, was in calm waters, with the exception of one occasion, that being the final race of the season, when the boats competed for the du Pont Trophy. This event was upriver and but for a heavy Nor'easter the boats would have raced under the same conditions that prevailed on previous events.

The competition in the various races saw practically the same boats which competed in 1916 with the exception of one or two, which were offered for coastal patrol work and taken over by the Government. However, there were many more boats which put in an appearance which prior to this season had not entered competition. The entries in the races were not lacking and there were a sufficient number of boats to make the contests interesting and close.

One thing which was accomplished in the racing under the new rules was the elimination of the chances for the slow boat with low rating to carry off the premier honors. The old rules gave the slow boats this chance and in the season of 1916 every race held on the Delaware River and on the coast of New Jersey was won by a low rater. This season this was eliminated and it was the middle class which forged to the front, with the high raters and scratch boats getting nearer to the standard which is to be desired. One detriment which proved the rules were not positive in bringing the boats closer together was the failure of the owners to state the dimensions of the propeller, which would have materially aided the regatta committees in their work.

The four race-meets of the Delaware River Yachtsmen's League were held under the 1916 rules and regulations of the American Power Boat Association, and they showed for the most part that another season with more racing under better conditions must be had before the two sets of rules can either be adopted or abandoned.



A Sea Mew, One of the New Popular Catboats Built From Rudder Designs



Sea Mew Close on the Wind. 14 Ft. Long, Built Big Enough For a Family

The competition was keen but at the same time in the majority of cases the boats with the low rating were the winners. Unfortunately for the racing on the Delaware there occurred a misunderstanding between the two organizations governing the competition, which did not help the game. A strict interpretation of the rules was the cause of the mixup, and the Association was in the right. Conditions will be righted prior to the opening of the 1918 season.

The racing on the South Jersey Coast was all that could be desired, there being the usual number of boats competing in the various classes to make the events exciting. The express cruisers and the open boats predominated although the cruisers were in evidence in the two classes. Four of the five race-meets were held with the Atlantic City and Ocean City Y. Cs. holding the stellar attractions. The scheduled race-meet under the auspices of the Corinthian Y. C. of Cape May was canceled, due to the necessities of war and the restrictions placed upon traffic in Cold Springs Inlet. There were just as many boats in competition as in previous years. Barnegat Bay was not represented by a race-meet.

The racing on the Delaware and on the inland waterways of Southern New Jersey was of such a calibre that it showed conclusively where the three sections stand when it comes to holding power-boat events. There was not another section or sections throughout the country which equaled the record of the local organizations. With plans already underway for the promotion of the sport next year with bigger and better races, the effort to obtain success is beginning to bear fruit.

Cottrell-Holmes Marine Engine

A WHITE power boat 52 feet long, making its headquarters at the Larchmont Y. C., attracted much attention in the early days of October from those on shore and those who navigated the Sound. Two or three times each day this vessel would leave its moorings and, with critical experts on board, would dart out on the Sound and then rush hither and thither, sometimes at high speed and sometimes just slowly moving ahead. The way the boat threw the spray indicated somewhat the speed it was traveling, and a few declared that the mystery boat must have been making close to 50 miles an hour. She was not, but she was moving very fast. The trials were not made to demonstrate speed but to show the power and reliability of a new engine. Had those interested in this new engine been looking for speed they would have had a specially designed hull, but instead used a hull which is now badly out of shape. It has hogged so that the stern is some inches higher out of the water than it should be. However, it moved fast and pleased all who were fortunate enough to witness the trials. Among those were representatives of the United States, British and Russian governments, designers and builders.

The engine has been built by the C. B. Cottrell & Sons Company at Westerly, R. I., and is named the Cottrell-Holmes marine engine. It was designed by C. D. Holmes, who has for years been well known in the marine engine world. About two years ago Mr. Holmes, who had a plant at Mystic, wound up his company and buried himself at Westerly to design and invent a high-powered dependable marine engine. He interested the Cottrell Company in his work, and the high character of the machine work done by that company is a guarantee of the high class of work found on the new engine.

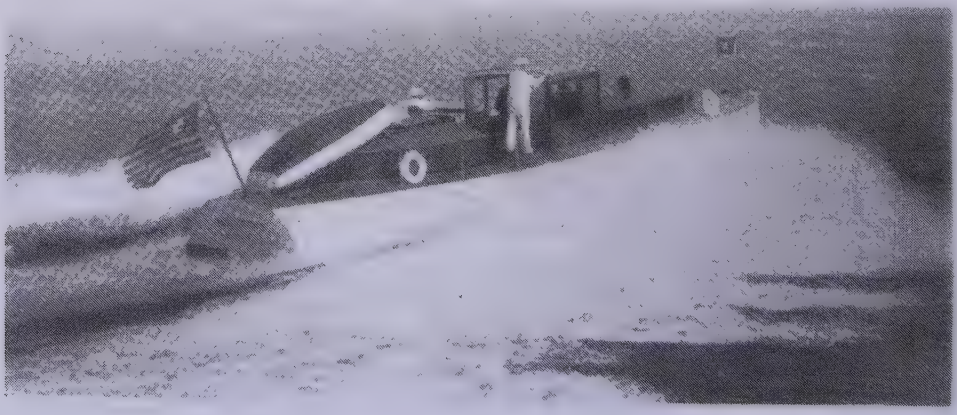
Mr. Holmes and his associates wisely decided to keep their work secret until everything had been perfected. There has been no talk even of what was coming. The engine was built and for more than a year has been thoroughly tried out in the boat, which is named Neowan, which is 52 feet long and has a breadth of 10 feet. Improvements and refinements have been made as they suggested themselves under the many exhaustive trials made, and now the company is ready to put the engine on the market.

Mr. Holmes realized that a high-powered engine was needed to drive patrol boats, high-speed yachts and other vessels, an engine that would be strong enough to withstand all strains put on it and at the same time not of excessive weight to make it prohibitive, and he and his friends think that they have solved all difficulties in the new engine, which is a long stroke gasolene engine of the twin-six V-type construction, developing 350-400 h.p. The engine weighs 3,400 lb and the space occupied over all is: length 8 feet 4 inches, height 3 feet 10 inches, width 3 feet 1¼ inches.

All working parts are enclosed, yet every part is accessible through covered handholes through which the working parts can be taken out without disturbing the engine or removing it from its base. There are no attachments on the sides of the engine and consequently it has a very clean-cut appearance. Its most striking feature is simplicity.

The engine is mounted on an extended base, which carries not only the crank shaft in five 3½-inch diameter bearings, but the reverse gear, flywheel and thrust bearing. This base also acts as an oil reservoir, and is provided with oil-circulating pipes and pumps for distributing the oil to all bearings. Another feature is the mounting of the crank shaft in the base, where, if need arises, it can be reached for alignment with the propeller shaft.

The base is cast from aluminum alloy, but can be made of iron when weight is not an important consideration. It has five main bearings for the crank shaft with deep



Neowan, Driven by New Cottrell-Holmes Engines, Making High Speed on Long Island Sound

© Rosenfeld

ribs under each shaft and the bearings are all removable without taking out the shaft.

The crank shaft is made from 40% carbon open hearth steel, heat-treated, ground and accurately balanced. It is 3¼ inches in diameter, including all the main bearings and the crank pins. The crank pins and the forward and after main bearings are bored out to save weight and form a part of the oiling system. There is a large flange on the after end of the shaft through which both flywheel and reverse gear are bolted. The connecting-rod crank boxes are 2 11/16 inches long, one ahead of the other on each crank pin. The cylinders are staggered with the opposite set to get a direct thrust on each crank pin. The connecting rods are hollow, as are the piston pins, which are clamped to the connecting rod and turn in the pistons.

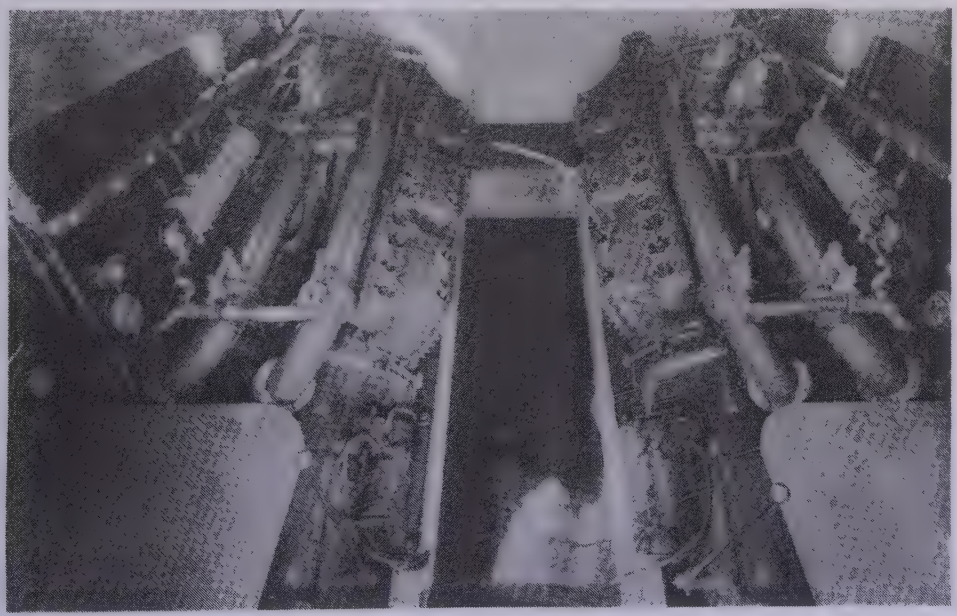
The cam shaft is made from high-grade steel, heat-treated, hardened and ground. All the cams are solid on the shaft. The oiling system keeps these cams under a constant spray of oil from the same pressure system that supplies oil to the valve lifters directly overhead. The shaft is mounted in the center of the crank case, where only one shaft is necessary to both sides of the engine.

The crank case which carries the cylinders is cast from vanadium bronze, which has a tensile strength of 75,000 lb. It is high enough to allow three handhole plate openings, 16¼ inches by 8½ inches, on each side of the engine, large enough to allow the engineer to reach in and take out each piston and crank connections intact, which can be done in five minutes. The case is tied together by a system of longitudinal and cross-bearing braces, which include the valve lifters and cam-shaft bearings with ribs across the case from top to bottom directly over each center bearing in the crank shaft. It is bolted inside to the base by a series of bolts on each side of the crank-shaft bearings in addition to the usual bolting on the outside. Being broad on the top, this case gives a very rigid support to the cylinders, which is very important when the boat is rolling in a heavy seaway.

The cylinders are cast from gray-iron alloyed with steel. They are cast in pairs with the water-jacket extending down to the crank case and a short sleeve piston guide projecting below. There is an opening in the one side of the jacket for cleaning, which is covered by a removable plate. Large water passages completely encircle each valve chamber. The unusual practice of extending the cylinder water-jacket down to where the cylinder and crank case join, prevents excessive heat radiating into the base. The valve caps are of aluminum alloy with narrow ribs within the top for heat radiation.

All the valves are 3 5/16 inches in diameter and all the gas and exhaust passages through the cylinders are more than half the cylinder in diameter. All valves are operated by one cam shaft within the crank case and the shaft is driven by a Morse silent (eccentric adjustment) chain, located under a cover at the front of the engine.

The pistons are 6 inches in diameter, made from magnalite, a metal that weighs only one-third as much



© *Rosenfeld*

Two Cottrell-Holmes Engines, 350-400 H.P. Each, as placed in the Meowan, in Which They Showed Their Reliability and Freedom From Vibration

as iron while being equally as strong. It is an excellent bearing metal, similar to Babbitt, and has heat-radiating properties that make it ideal for a piston. The piston carries two rings above the piston pin. The pin is made of steel tubing hardened and ground and turns in the piston.

The carbureters are of the double air-valve type, in duplicate, and are mounted above and between the two rows of cylinders with the intake manifolds to which they are connected extending down into the openings between the two rows of cylinders.

The engine is arranged with two spark plugs in each cylinder, which gives an instantaneous explosion on opposite sides of the combustion chamber. The ignition is by two separate independent magnetoes of the two-spark Berlin type, but provision is made for a battery ignition if required.

The oiling system is by pressure feed and is supplied by two rotary pumps placed in the after end of the base. Each pump can be easily and quickly disconnected for repairs, and the system in the meantime supplied by the others. The oil passes through two strainers before reaching the pumps and is then forced through tubes within the passages along the inside of the crank case to the final strainers at the front of the engine. It is then forced into distributing tubes within the crank case and the base to all bearings, including the valve lifters, so that all the bearings are under constant pressure feed. Every part of the engine is virtually floated in oil.

There are two circulating water pumps, one arranged to be used for the bilge when required. Both pumps are driven through flexible couplings from the forward end of the crank shaft. Their position at the front of the engine below the water-line insures water circulation by the momentum of the boat even though the pumps become disabled.

The exhaust manifolds, two in number, are water-jacketed and mounted between the cylinders, where they are practically out of the way. These manifolds are connected to the cylinders at each valve opening by water-jacketed elbows.

The engine is fitted with a Bijur electric starter and generator mounted on either side of the enclosed flywheel directly back of the after end of the crank case. The flywheel is between the crank shaft and the reverse gear, where it comes in between the load and the power.

The propeller thrust is of special design S.K.F. type, comprising a self-aligned ball radial with a forward and after ball thrust, all contained within a solid sleeve mounted between the lower base at the after end of the engine, under cover of the reverse gear. The boring for the thrust sleeve and the crank shaft is done on the same setting.

The feature of accessibility is worked out in a manner heretofore impossible in a V-type of engine. The pistons with the connecting rods can be taken out without disturbing other parts. All the valves can be removed in less than an hour and put back again in the same time. The oil pumps can be gotten at quickly and the water pumps are equally accessible in the front of the engine. All working parts can be taken out and replaced without disturbing the engine on its base. Carbureters, magnetoes, water and oil pumps are independent for each side of six cylinders, so that in an emergency the cylinders on either side of the V can be run separately.

The general dimensions are:

Diameter of piston	6 in.
Length of stroke	8¼ in.
R.P.M.	1,000-1,400
Length of base, over all	7 ft. 8½ in.
Over-all width across corners of cylinders	3 ft. 1¼ in.
Height of manifolds from center of crank shaft	34 in.
Depth from center of crank shaft to bottom of oil sump	11 in.
Depth from top of crank case to bottom of oil sump in the base (crank-shaft support)	2 ft. 7¼ in.
Crank-shaft bearings (five in all)	3½ in. dia.
Crank-pin bearings	3½ in. dia.
Projected area of one crank pin.	10 sq. in.
Projected area of all five main bearings of the crank shaft	65⅝ sq. in.
Total displacement of cylinders.	1,798.73 cu. in.
Weight complete	3,400 lb



With Two Twin-Six V-Type Cottrell-Holmes Marine Engines, Neowan Moves Very Fast

New Cruisers and Other Craft

New yachts of all sizes continue to make their appearance. In many of the builders' yards work was much delayed because of the war and that work is being steadily completed. At present war work is occupying the attention of all the builders who have yards where such work can be done, but these are still able to devote some attention to pleasure craft and some of the new ones are illustrated herewith.

Acoma, New Scout Patrol

The 60-foot Speedway express cruisers built by the Gas Engine & Power Company at Morris Heights promise to rival in popularity the 52-footers built by this company. Eight 52-footers were built this year and five of those are now on Scout Patrol duty. Now the 60-footers are being turned out and two, the Acoma, owned by T. D. Partridge, and the Velocipede, owned by Kimball Atwood, are the first two of this new fleet.

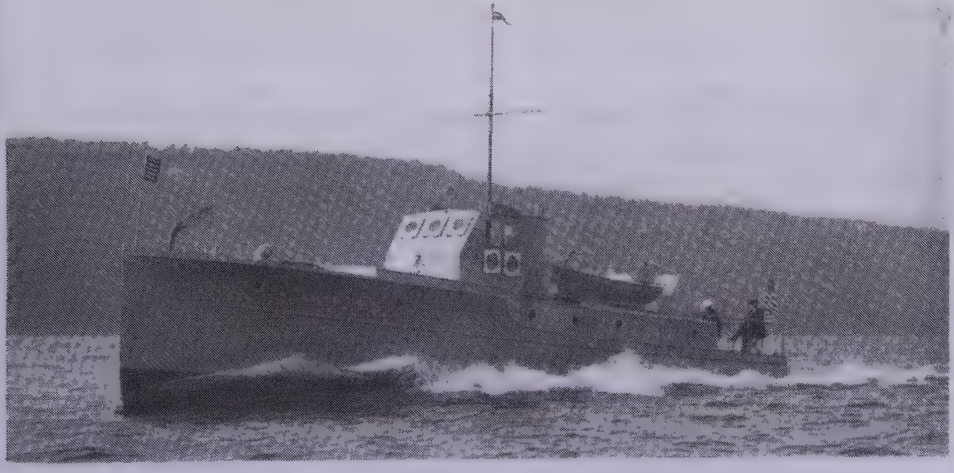
Acoma was the first to be launched. In model it is very nearly the same as that of the 52-footers, the boat lines being very similar and the breadth the same. In construction it is rather heavier than is necessary for a boat of this kind. A steel conning tower, with its floor 9 inches above the main deck, is placed directly aft of the space provided for the 1-pounder, and there is a large ammunition locker directly below. This section of the vessel is especially strong, being well braced with steel angles and yellow pine pads.

The interior arrangement is not unlike that of the smaller boat. In the forecastle there are comfortable accommodations for four men. Amidships in an engine room of more than ample dimensions are two eight-cylinder Model M, 5 by 7-inch Speedway engines. Aft of the engine room is a large galley on the starboard side, opposite which is a lavatory. The main cabin has deep, upholstered spring berths, sleeping four men. Two pipe berths are fitted in the engine room.

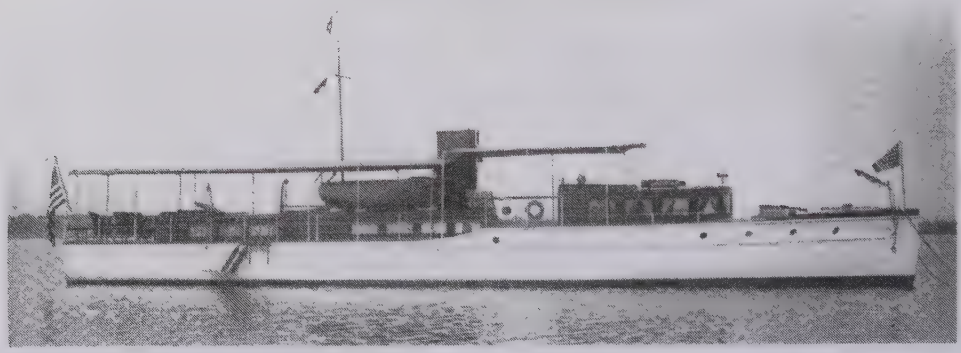
Acoma can maintain a speed of 26 miles an hour. The fuel tanks will hold 500 gallons, so that the boat has a large cruising radius. Mr. Partridge, as soon as he accepted the vessel, offered it to the Navy Department and it has been assigned a number—S. P. 1228. The Velocipede, for Kimball Atwood, an exact duplicate of Acoma, has been launched.

Some of the boats of this type now under construction will be used as yachts in Southern waters this Winter. Those fitted for yachting have slightly different arrangements from the patrol boats. There is a double stateroom and connecting toilet, and a companionway leading to the deck is between the stateroom and the cabin. The cushion backs of the cabin seats can be made to swing up, forming two full-width single berths. The seats proper are then really spring cushion berths, about 38 inches wide, as they extend well under the side decks. The forward stateroom has two single berths, bureau, wardrobes, etc.

These 60-footers are not only well adapted for patrol work, being larger than many now in the Coast Defense service, but they embody new features which have been developed by experience with other boats. The 60-footers are the largest stock cruisers yet turned out by any boatbuilding company.



Acoma, Scout Patrol, T. D. Partridge, Owner, 60 Ft. Long, Powered With Two 8-Cyl. Speedway Engines; Speed 26 M.P.H.



Josephine, A. H. Bromell, Owner, 75 Ft. Long, Built by the New York Yacht, Launch & Engine Company, and Equipped With Two 8-Cyl. 20th Century Engines of 65 H.P. Each

Josephine, an Attractive Boat

Josephine, a 75-foot twin-screw yacht, built for A. H. Bromell, of the Munson Steamship Company, by the New York Yacht, Launch & Engine Company at Morris Heights, is one of the most attractive of this year's new vessels. This is the second yacht built by this company for Mr. Bromell.

The yacht is arranged with the crew's quarters forward, a sunken deckhouse in which is the engine room amidships, and the owner's quarters aft. The owner's quarters consist of two single staterooms, a bathroom, a double stateroom and a lobby. These quarters are entered from the starboard deck.

The yacht is well appointed, as the pictures show, and the furnishings are handsome without being ornate. Power is furnished by two six-cylinder 20th Century engines of 65 h.p. each, and all engine controls lead to the bridge.

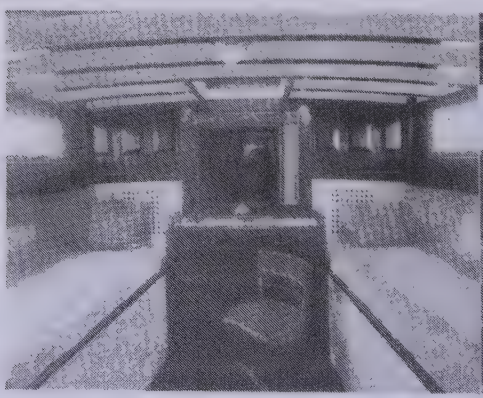
The dining room is in the deckhouse, and the galley is at the after end of this house and can be entered directly from the deck or the dining room. This arrangement is a good one, as it keeps the dining quarters separate from the sleeping quarters of the owner.

The hull is built with oak stem, stern and frames and yellow pine planking all copper fastened. The exterior of the deckhouse is mahogany and the interior is paneled mahogany. The owner's quarters are in white enamel with mahogany trim. The Josephine is equipped with an independent lighting outfit, and carries a dinghy and power tender.

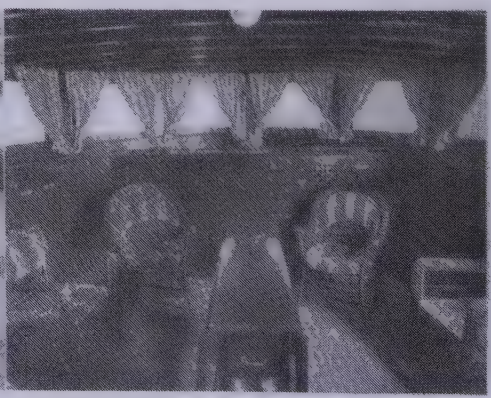
Sachem, a New Cruiser

Sachem, a 90-foot twin-screw cruiser, has recently been completed at the Matthews Boat Works, Port Clinton, O., for N. Bruce MacKelvie, a member of the New York Y. C. This yacht was built from designs by Gielow & Orr.

The yacht is very substantially constructed. The keel, stem, and sternpost are of white oak; the keelsons,



Double Stateroom in A. H. Bromell's Yacht Josephine



Dining Room in the Deckhouse of the Twin-Screw Yacht Josephine

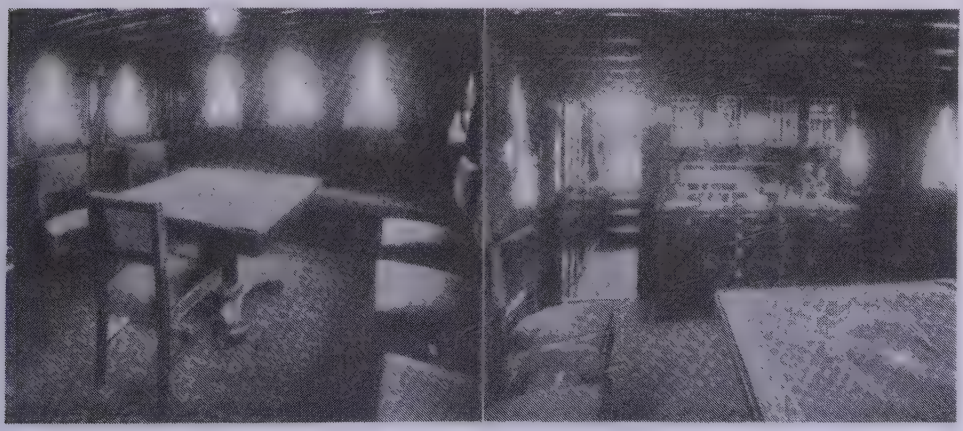


Sachem, 90-Foot Twin-Screw Cruiser, Built For N. Bruce MacKelvie by the Matthews Boat Company, From Designs by Gielow & Orr; Powered With Two Winton Engines; Speed 17 M.P.H.

bilge stringers and engine stringer are of yellow pine; the frames of selected white oak steam-bent to shape; the deck beams are white oak and the deck is selected white pine. The outside planking is of yellow pine and all fastenings are of copper, composition and brass screws. The yacht is driven by two Winton engines each having six cylinders 6½ inches in diameter by 9 inches stroke, which drive the yacht 17 miles an hour. Sachem is lighted by electricity, which is supplied by a six-cylinder Winton generating set of 5-k.w. capacity. There is also a large storage battery, and the yacht is fitted with electric heaters. Two gasolene tanks have a total capacity of 1,000 gallons of fuel.

The interior arrangements are very attractive. Forward, immediately aft of the collision bulkhead, is the forecastle 8 feet long and the full width of vessel. It is arranged with lockers, transoms, and berths for four men. Next aft, on the starboard side, is the crew's toilet room, followed by a stateroom for the captain, engineer and steward. Next is the messroom, and immediately aft of this is a galley fitted with a large ice-box and refrigerator on the port side. On the starboard side is a large storeroom dresser with sink, arranged for stores underneath, also shelves, dish-racks, etc. The galley is fitted with an alcohol range, heater, and hot-water supply. A dumbwaiter leads up to the pantry in the after end of deckhouse. The engine room, with watertight steel bulkheads at each end, is next.

The owner's stateroom is aft of the engine room and is 9 feet long and the full width of the vessel. On each side is a transom 6 feet 8 inches long, by 18 inches wide, with two drawers underneath. These are fitted with spring cushions. In this stateroom is a desk, chest of drawers, bureau, dressing table and a brass bed. There is a connecting bathroom on the port side and a large wardrobe on the starboard side. Aft of this is the lobby



Two Views of the Dining Saloon of the Yacht Sachem, Finished in Mahogany, Well Ventilated and Lighted With Heavy Plate Glass Windows





Two Staterooms in the 90-Foot Cruising Yacht Sachem, Built Recently For N. Bruce MacKelvie, New York Y. C.

with transom and large lockers, followed by a toilet room on the starboard side and a stateroom on the port side. The after stateroom is 8 feet 4 inches long and extends the full width of the vessel.

The deckhouse is 20 feet 4 inches long and is constructed of mahogany inside and outside. The pantry, 7 feet wide and 7 feet fore-and-aft, is in the after end on port side. On starboard side is a passage with locker for oilskins, etc.

The steering bridge is immediately aft of the deckhouse, and aft of this is a conventional ventilating stack. All outside joinerwork, skylights, companionway, wooden deck fixtures, etc., are of mahogany. The planksheer, as well as the rails, are of like material.

The principal dimensions are:

Length o. a.	90	feet	7	inches
Length on w. l.	87	"	6	"
Breadth	16	"	1	"
Draught	5	"	2	"

War Tax on Yachts

All yachts are now subject to tax according to the war revenue law. Many inquiries have been made about this tax and the paragraph relating to yachts is given herewith.

That on the day this act takes effect and thereafter on July 1st in each year, and also at the time of the original purchase of a new boat, by a user, if on any other date than July 1st, there shall be levied, assessed, collected and paid, upon the use of yachts, pleasure boats, power boats and sailing boats of over five net tons and motor boats with fixed engines, not used exclusively for trade or nation's defense or not built according to plans and specifications approved by the Navy Department, an excise tax to be based on each yacht or boat at rates as follows: Yachts, pleasure boats, power boats, motor boats with fixed engines and sailing boats of over five tons, length not over fifty feet, $1 for each foot; length over one hundred feet, $2 for each foot; motor boats of not over five net tons with fixed engines, $5.

Over-all length is to be measured in determining the length of all boats taxable. If the first tax is paid at any time prior to July 1st, the amount to be paid will be scaled according to the number of months yet to lapse.



Roomy, Well-Arranged Galley of the Power Yacht Sachem



Engine Room, Equipped With Two 6-Cyl. Winton Engines

Canoeing on Manhasset Bay

By Wilf. P. Pond

Manhasset Bay is the home of the Star Class and the Port Washington Y. C. is the headquarters of that famous class, because George A. Corry, father of the Stars, is a member of that club. Naturally the chief interest among the members of that club centers in the Stars, and to use a canoe on the club waters requires not only skill in handling but some temerity on the part of the owner. Wilf. P. Pond, a well-known writer on all sporting topics, is a member of the Port Washington Y. C., and he has a paddling canoe which this year was rigged for sailing but not in the orthodox way. His efforts caused much good-natured banter from his clubmates, but now that the season is over the efforts of Mr. Pond are being highly praised and as a reward for his efforts a large picture of his canoe under sail is to adorn the clubhouse.

Mr. Pond has always sailed small boats and has made many cruising trips in the old Rob Roy canoes. The first that amounted to anything was from the Baltic down through the Black Forest to Paris. On this trip, of course, several long portages by farm cart were necessary. He is also responsible for revolutionizing the racing canoe in England by having one built 20 feet long, 19 inches breadth, that weighed 21 lb. The advantages of this canoe were that the paddle went in close to the side instead of 2 feet away, thus giving direct power. She yawed about 3 inches less at each stroke and was 40 lb lighter than other canoes. Mr. Pond won his first race, a mile at Gainsboro, by nearly a quarter of a mile. Mr. Pond has had an able assistant in his canoeing this year—his wife—and she threatens to tell of her experiences. Mr. Pond tells his now.

ALWAYS fond of pottering around in a canoe, I was never satisfied with the orthodox sail plan for the canoe that is intended to be paddled rather than sailed, so—without at all criticizing the real two-masted sailing canoe and its efficient rig—I conceived the idea of adapting the cat-rig to a 17-foot Old Town canoe. I sent specifications to the makers for a mast giving a 15-foot hoist and a 9-foot boom, and for a pair of leeboards 3 feet in depth and 9 inches wide, just to see how the idea would work. The leeboards are attached in the usual manner, amidships, but the mast is stepped 18 inches from the prow by using an ordinary mast brace and gunnel clamps arranged to fit at that spot; there is, of course, a tiny foot for the mast to hold it in position. And I find this works well without any bobstay or shrouds. In fact, I can comfortably hold up to the wind no matter how it blows and have carried on, with both boards down, when the Stars have been running gunnel under. With a due North wind I can make N.E. and travel well, although a broad reach is the best sailing. Running before the wind is not so satisfactory from the pleasurable standpoint, as I only have part of one board down and, being right on top of the water like a skimming dish without much beam, she yaws a good deal. So long as the waves run around two feet from hollow to crest, such as one finds in a blow on a fair-sized bay, she behaves splendidly, although the sailing is a trifle wet. But who minds that? In a strong wind, however, I do not try to get nearer the North than due East, and to obtain this course advise paddling along the lee shore until the right advantage is obtained. Then I get over, up to my waist, adjust my boards, step in, with water enough under me to clear bottom, haul in the sheet and off I go.

It must not be imagined, however, that this is a rig for a man ignorant of sailing. Most decidedly it is not. But with fair knowledge and the caution a sailing man always exercises, even in a light wind, there is little danger of an upset. In fact, I have yet to take my first spill.

To be candid, at first I found it rather awkward, for so many new points had to be learned. To begin with, I found it necessary to take great care to keep the boat underway. So I always start with a few stiff paddle strokes, and then, when she moves haul in my sheet and lay my course. This keeping underway must be especially remembered when sailing closehauled, and if a sudden veer in the wind stops her headway—especially when there are waves—the sailor must be ready with his paddle to keep her going before catching the full force of wind again.

In light winds I carry the sheet under my foot and steer easily with the long paddle and, by the way, I sit on the stern seat and not on the bottom of the canoe. In a moderate or hard blow I carry the sheet in my right hand, so that when the puffs come, or when she



Wilf. P. Pond Sailing His Canoe on Manhasset Bay

heels over, I can extend my arm, spill some of the pressure and, by drawing my arms in again, have her in the full force of the wind. I steer with the long paddle passed between my arm and body—right or left, according to the tack—and obtain the necessary pressure alternately from the forearm or from the hip. This is infinitely better than any rudder arrangement, unless one has three hands, and even then to have the rudder lines in the usual loop round the body would be courting trouble in case of an upset.

When going about I use very stiff paddle pressure, and automatically haul in the sheet; then I jibe quickly, letting the sheet run free, slip my paddle forward for two or three stiff strokes—to avoid the dead center that would otherwise be caused by my long leeboards—and then haul in the sheet again to catch the wind.

Only in a stiff blow do I use both boards. In a moderate blow I use one board, and in a light blow, or when reaching, one board tilted at an angle that gives me from 12 to 18 inches water pressure. When making a landing, I run in fairly close—according to the depth of water—bring her up into the wind, turn up the boards and then paddle in with two or three strokes. I forgot to say I carry my 135-lb wife, who sits just astern of the leeboard brace, from which point she automatically trims the boat and is right at hand to vary the leeboard depth as desired. That the canoe makes a good showing will be seen by the illustration, which was taken in a breeze strong enough to make the water crest and break.

For picnic purposes—we do a lot of this—we sail outside Manhasset Bay to the Sound, choose our spot on shore, land, turn the canoe up for a wind-break, using a leeboard as a prop, and then lay the sail with the mast along the canoe keel. I secure it with a lashing attached to the mast and passed under the canoe to a hold on a seat, and then extend the sail—for a shade area—by carrying the sheet forward over the two paddles lashed together for a stay and then down to a peg driven in the sand. This gives a patch of shade about 8 by 10 by 8 feet. I find I can go anywhere in reason with this tiny craft, that I get a fair amount of speed—probably three times as much as with the orthodox single canoe sail and also better direction—and, as against the bother of a regular small sailing boat, I have no mooring, no bailing out of rain-water, and no bringing her from the moorings to the float; she is ready at a moment's notice and is as quickly stowed up on the lawn at the Port Washington Y. C. headquarters.



Novel Way of Making Camp With Canoe and Sail

A last word. In case of an upset—I have experimented with this—carry a life-preserver cushion and throw it to your passenger, if he or she needs one; swim to the mast and unship it; have always in one certain place an everyday bailing scoop and with this dash out enough water to permit you and your passenger to balance the canoe on an even keel while one of you leans across it and bails out still more. It will then be easy to board it and bail out the rest. Then the mast, with its dripping sail, can be retrieved, stepped, and the voyage resumed. The canoe and its rig can be carried on the top of the power-boat cabin and taken anywhere on a cruise without being in the way. The approximate cost of mast, sail and leeboards, made to order, is less than twenty dollars.



A Memory—50-Footers Racing on Long Island Sound

Accessories and Subterfuges

A new department is started in this issue of THE RUDDER. *It will deal with novelties, inventions and aids to comfort and will be conducted by Charles E. Starr, who is known to Rudder readers through his many interesting articles about power boats, engines and power-boat handling. Each month short descriptions of all sorts of odd things will be printed. There are innumerable oddities put out by many concerns and made up by amateurs all of which are of interest and often of much practical use. Rudder readers are asked to contribute to this column. If you have something on your boat or engine that serves you well it will serve others too. Power-boatmen are banded together in a brotherhood and one always wants to help another.*

THE season has brought out about the usual number of new devices to catch the wary dollar of the power-boatmen, but war conditions and the well-known h. c. of l. (and gasolene) have produced even more ingenuous imitations or substitutes in many a club shop.

As in a New York flat, compactness is a necessity on a small boat, and the "Reel Trouble Light," put out by the L. C. S. Sales Agency, of Flint, Mich., will appeal to most men who putter about the engine, as the kitchen reel clothes line will to the "bug's" better half. The wires are kept out of the way when not in use and pull out like a tape when needed.

There are all sorts of trouble lamps on the market, the simplest being the funnel-shaped lamp with reflector and lense to magnify the small voltage and candle-power lamp deriving current from dry cells or storage battery. There are numerous devices using one and two dry cells. The former usually is without a switch and uses a lot of current, and somehow the latter usually has absorbed enough water to be out of order when needed.

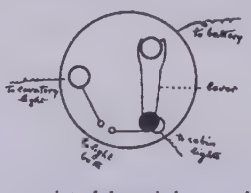
A novelty is the magnet trouble lamp. This is not new. It was brought out several years ago for the auto, but discarded because it was usually in trouble itself, was heavy, and when aluminum became a large part of the car, was often useless. It has an ordinary electro-magnet in the handle. The current used for the light passes through the coil and magnetizes the soft iron core. You can stick this lamp against any iron and it will stay where you put it. It uses a lot of current, however, and though with new improvements it is again on the market and is recommended for power-boatmen now, it is still rather heavy, and is not really useful unless one has a 12 or 24-volt storage battery fed by a generator. A much better device for getting the light where it is needed is to have a protecting wire form over the lamp or lense, ending in a hook large enough to slip over the various parts of the engine. One can find usually some place to hang the light, leaving both hands free to work. Of course this hook may be added to any sort of a trouble lamp.

Some time ago an inventive fellow devised a trouble lamp to be held in place by a rubber vacuum cup. It works all right, at least for a time, where there is plenty of flat surface, but about a marine engine there are few flat surfaces large enough to attach the vacuum cup; but it is a mighty attractive thing in a display case.

There is a flood of new kinds of solder to be used without fire, or with torch or soldering iron, but the ingenious boatman rarely will use a makeshift for a permanent repair of his gas-pipe line or water pipes. I saw a fellow do a neat trick a few days ago. There was a break in the gas pipe, which led from the vacuum tank to the carbureter. He had no soldering outfit aboard, but he got out a piece of tire tape and then took a wad of gum from his mouth, placed the ends of the pipe together, sealed the joint with the gum and tapered it so that the vibration would not draw the ends apart.

"That'll do until we get home," was his sole comment. It did.

I know another "bug" who discovered a lively leak in the fresh-water supply pipe. He was far from a plumber, but he had aboard a small lump of marine putty, made of white lead and common putty, and he "wiped a joint" with this and with tire tape bound it fast. It was such a good job that it still is in the boat, and has been tight for two seasons.



I wanted a lighting switch for my boat this year. After pricing those on sale I bought a common three-way wooden base switch. I desired to have lights in the cabin or in the lavatory, or in both, without using several switches, so I took the center contact point of the switch out and replaced it with two small machine screws 1/16 inch apart. These screws were connected by wire on the back of the switch to the contact point on either side. By throwing the switch lever to the contact point on one side the cabin lights were turned on; the other contact point controlled the lavatory lights; and if I wanted to have them all on I threw the lever so that it rested upon both of the machine screw heads, sending the current both ways. This is not patented and it can be adapted for several connections by a little study in wiring—a good job for a winter evening. Some day I am going to figure out a switchboard on this principle.

Practically all new boats are equipped with electric lights throughout and there are many electric running lights sets advertised, some of which are very efficient; but the fellow who wishes to make a cheap substitution, supplying current from his storage battery, may purchase adapters which clamp on to the burners of the oil lamps. To insure a watertight connection deck plugs are made, so that the lamps may be taken in when not needed, and are made ready for service quicker than the oil lamps, for they need but to be set in place, the plug inserted in the deck plate and then turn on the lighting switch.

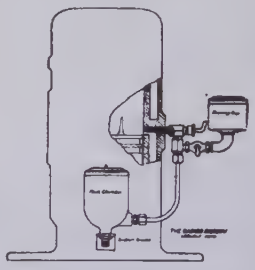
Several "bugs" I know have a better arrangement. They have removed the lenses from the side lights, fitted

a metal or wood top, and set the lamp thus made in the angle of the screen box, making the joints watertight with putty and lead. An ordinary socket is fastened to the bottom of the screen box and a metal tube conveys the light wire through the deck, being packed to make it waterproof. Stern and bow lights have a waterproof double wire running from the lamp to deck plates.



The F. W. Wakefield Brass Company have out an ingenious searchlight called the Red Spot, which, besides the usual searchlight features, has a push button which converts the light into a distress signal. The push button controls a transparent red cylinder which envelops the lamp and the reflector sends a red ray instead of a white one. It ought to be useful for the fellows who are often in trouble and need to send a distress signal for a brother "bug" or for the club launch.

The Barker Factory at Norwalk, Conn., is putting on new engines a new type mixer or fuel valve designed for either gasolene or kerosene, and the claim is made that it will vaporize either. The valve is set in a hand-plate halfway up the side of the cylinder and injects the mixture directly upon the baffle plate. The claim is that as soon as the engine is warmed up the hot baffle plate will insure perfect vaporization. One thing I like about the sketch of the device is that the needle valve is up where it can be adjusted without breaking one's back or getting mixed up with the machinery. The start is made on gasolene with the device and then kerosene is switched on. When warm the engine usually starts without gasolene priming. An adjustable dripcock for introducing water into the air intake pipe is provided also. With gas soaring and likely to be much higher next season, kerosene-burning devices are worth investigating.



One reason why so many engines and accessories are condemned after trial by power-boatmen is that the manufacturer's instructions are not followed. A salesman recently told me that it seemed impossible to get purchasers to read the books of instructions furnished with the engine. "They ought to read every line," he said, "and learn it by heart if necessary, and read it many times to make sure that nothing is forgotten." Naturally the manufacturer does not give instructions simply to waste paper, but because the best way of operation has been worked out carefully and scientifically. If the instructions were read more and less attention were paid to so-called "experts" the owner would be better pleased, for he would have less trouble.

Gray Days at City Island

Though more fortunate than Port Jefferson, which for the past two months has been completely barred to yachtsmen, with all the yachting activities of the port entirely suspended, City Island is feeling the effects of the war, the gray of war paint predominating everywhere over the conventional white and black of the pleasure navy. On the mainland of Rodmans Neck, in Pelham Bay Park to the South of the roadway, is a large cantonment, practically identical with those described in the October RUDDER, for the recruits of the Naval Reserve. At the beginning of this month it was still far from completion, but many frame barracks were ready, a large Y. M. C. A. tent was up and occupied, and the grounds were crowded with mechanics and recruits, all busily employed.

In spite of the exceptional dullness of the yachting season a large number of small yachts were moored as usual in Eastchester Bay; on the Sound side of the island, in the Roads, though the majority of the anchored craft showed the war gray, a number of the larger yachts were waiting their turn to haul out for the Winter. In this matter the yacht yards are at a decided disadvantage this year, as the railways are often commandeered for naval work on the auxiliary fleet; with little or no regard for the interests of either the yard owners or the yacht owners.

The old Wood yard has been vacated by the younger generation, Wood & McClure, the firm having moved to West Mystic, Conn., where it has purchased the yard of the Holmes Motor Company; B. Frank Wood, the son of the founder of the yard, has resumed control and will run it as usual, for both building and storage. At the present time the shop is empty save for the one-design 38-footer, as yet unnamed, built for W. R. Timken, who was unable to use her this season. Of late the yard has been busy with work on the yachts of the auxiliary fleet. At Jacob's Yard three of the new 110-foot scout boats are still in the water, two having left the yard. The last of the five was launched on October 3d. The 55-foot power yacht designed by Hand and built for L. G. Hamersley is afloat in the basin, owing to her owner's absence in France. The cutter Aurora, recently bereft of her lead keel, lies on the bulkhead, and nearby are two interesting cases of dry-rot, a steam yacht built in 1905 and a gasolene boat built in 1908. In each case the bow has been opened for survey, disclosing a stempiece that is a mass of punk from head to scarf. A number of converted yachts are at anchor off the yard for work of various kinds. At Nevins's Yard, in addition to the usual hauling for storage, Government work is also underway. The Ratsey sail loft is busy with an order for tents and another for drag-ropes for the Navy Department, probably for the Marine Corps; these ropes being used for the hauling of guns by man-power. At Kyle & Purdy's Yard the steel yacht Haida is on the stocks.

Fire! Help!!

By Charles A. Starr

HAD the owners of a raised deck cruiser burned at Croton Point early in August kept their heads, a disastrous fire might have been prevented, but thinking discretion the better part of valor they plunged overboard and left the boat to its fate. Fortunately, other boatmen came to their assistance and saved the hull, after the cabin had been destroyed.

If they had kept their heads!

I suppose there is nothing the average power-boatman is afraid of more, or which he understands less about, than a fire, and a cursory inquiry into the several fires which have come within my notice this year convinces me that if the owners had not been half-scared to death at the first puff of smoke and wisp of flame the fires might have been put out with trifling loss.

When fire breaks out aboard your boat
And you are in a sorry plight,
Casabianca emulate—
Just stay aboard the flames to fight.

At that the percentage of fire loss among power boats is not large; but there are ways in which it may be made considerably less, and then there is a degree of satisfaction in feeling that one knows what to do and has the means of doing it if fire occurs.

Are there ways of preventing fire aboard power boats and of extinguishing it after it starts? These are the questions given me to answer for the benefit of THE RUDDER family.

I had a near-fire on my own boat on a recent trip. The exhaust pipe runs for some distance alongside the passageway to the rear deck. It is covered with asbestos plaster back to where the cooling system water enters the exhaust pipe. To give it a little better appearance I had covered the plaster with a piece of sail-cloth. Half an hour after I left the anchorage I smelled smoke and discovered that the sail-cloth was afire. As I knew there was free oil in the bilge and perhaps a little gasolene, I lost no time in ripping off the canvas, smothering the blaze, and then tossing the canvas on the front deck, only to discover five minutes later that the wind had fanned the embers into another blaze. This time the canvas went into the water and the pipe now is covered with asbestos cloth over the plaster.

What might have happened had a fragment of the burning canvas dropped down into the bilge I do not care to state; probably I would have been obliged to use the Pyrene extinguisher; possibly I might have had to row ashore and let the boat burn.

Yet I have called myself rather particular on the fire danger, for smoking is barred aboard, likewise lighted matches or open torches from around the engine or bilge, for I use an electric trouble light, and, in fact, electric lights for all except running lights; but here was a danger from an unexpected source, and now I understand the question in the fire insurance application, which deals with the exhaust pipe touching woodwork, better than I did before.

I am inclined to think that most of the fires come from ignorance of ordinary and proper precautions. In the first place, 90% of the fires comes from backfire or carelessness in tossing matches or cigarette stubs about. The other 10% is due to ignorance concerning lights and gasolene fumes, or to accident; the entire 100% is preventable, including that due to backfire.

Now backfire, or any other kind of fire, could do little or no damage were there not free gasolene, or the fumes created thereby, where either has no business to be. This is due to leaks in the pipe line or about the carbureter. It is possible to have a perfectly tight pipe line from gasolene tank to carbureter. It simply means care in installation and in replacing the pipe when it is necessary to open up the line for cleaning. I like a solid brass pipe, connected by regular fittings, with unions at several convenient points, so that the entire line need not be torn to pieces if sediment collects in it at some angle. Joints can be put together with shellac, which makes a tight connection. The connection to the carbureter should be shellaced also, and a drip pan, with an outlet where it can be drained off, should be installed under the carbureter. This is required by the insurance regulations. If the carbureter be above the water-line the drip could be piped outside the boat; but this is rarely the case, and the outlet pipe should be convenient for draining the pan.

With this arrangement there need be no gasolene in the bilge to take fire at the slightest pretext. True, there will be oil and grease there so long as engines and gears throw these things about. I know one power-boat owner who puts washing soda in the bilge beneath the engine every little while to get rid of the grease and oil. In fact, he declines to clean out the bilge when overhauling, as it is easier to use the washing soda and let the bilge water and rocking of the boat do the rest. The motion sloshes the solution about enough to make soap of soda and grease and it pumps out easily.

The remedy for matches and cigarette stubs and the peril attached thereto is obvious. If the guests will not be careful, do not invite them aboard again; if it is yourself who is careless, probably there is no cure for it.

Little drops of gasolene,
Tiny little flame,
When they come together
Always act the same—
Which, I rises to remark,
I don't blame upon the spark.

The sting may be taken out of the backfire by a simple contrivance recommended by H. Clifford Brokaw, Principal of the Motor Boat School of the West Side Y. M. C. A., New York City. He advises placing over the air intake of the carbureter a fine wire gauze screen, such as is used in the miner's safety lamp. Anyone with a bit of gumption can fit on a cap of the gauze, to be soldered, wired, or clamped over the intake. Then if there be a backfire the blaze will not pass through the gauze and so cannot reach the gasolene fumes and make trouble.

A year or so ago I saw advertised a fire prevention gasket to go between carbureter and intake manifold, but Mr. Brokaw does not believe it would be successful, for, while it doubtless would prevent fire from passing,

the gauze would be very likely to cause an excessive condensation of gasolene when the engine is running. The gasolene carried into the manifold has not been turned into gas, but has merely been broken up very finely and is carried in suspension by the air. Anything which obstructs the passage into the cylinders causes a deposit of some of the vapor and interferes with the mixture.

Knowing him to be an expert in the ways of gasolene, I went to E. W. Marshall, of the United States Power Squadrons, owner of the Fandango and a "bug" for years, to obtain his views on boat fires. He immediately called attention to the fact that gas fumes are heavier than air and that not only liquid gasolene, but the fumes, a much more dangerous combination of air and gasolene vapor, both are to be found in the lowest part of the boat, so that the presence of free gas is not always detected by the sense of smell, as it would be otherwise. The bilge might be a tinder box without making itself apparent. This is the real danger of allowing gas to leak and settle in the bilge.

Strangely, few attempt to ventilate the bilge. One owner at the New York Motor Boat Club this year put in portholes to ventilate the bilge under the cockpit; but he did it because he feared dry-rot, and never once thought of gasolene. Every boat which has the engine installed under or partly under the cockpit, or which has gasolene pipes running through the spaces under the floor, should have the bilge ventilated, so that there will be a good circulation of air to carry off the fumes, otherwise a spark or match will wreak havoc.

Mr. Marshall called attention also to a source of danger usually overlooked—a spark from a short-circuit of the ignition wires, or at the distributor or magneto. These are too frequent to be minimized. Where the engine installation is in an open space so that air or fumes are not confined about it, the short-circuit spark is not so likely to cause trouble as when the installation is under the cockpit or bridge deck floor. But magneto and distributor, from one cause and another, do spark badly at times, and they usually are set low on the engine, down where the fumes are the most dangerously accumulated.

Several manufacturers have recognized this danger and are installing the ignition devices near the top of the engine. It is worth making a change in installation to avoid fire danger.

Mr. Marshall found that his engine smoked badly from flooding the crank case with gasolene; being unable to prevent the accumulation of gas he put in a breather connected with the carbureter and thus sent the gas back into the mixing chamber. It worked all right and stopped the smoking, but a friend called his attention to the danger of backfire into the carbureter with this arrangement, and he took it out. The smoke annoys him, however, and he is figuring on replacing the breather, with the addition of a gauze gasket to take care of the backfire.

Another source of danger is from the galley and lights. Leaks in alcohol or kerosene stoves produce the probability that sooner or later a train of fire will be led downward from the stove until there is a puff as the flame meets gasolene fumes, and then a period of excitement. The same danger is present when filling and lighting the running lights. It is so handy to put them on the floor when filling them and perfectly natural to light a match and touch it to the wicks before lifting the lamps up. In a word: *DON'T!*

Down on the floor the danger from gasolene fumes is greatest and your match may light the whole boat in a way you will not care for, while, if you are bending over the lamps, you may get a puff of flame that will put out your own lamps instanter.

But, if after all precautions are taken, fire comes, do not run away from it, but stay to fight it. Naturally one should not let the fire get between him and a safe exit. With this assured, fight and fight hard. A minute at the most will decide whether you are to lose a boat or save it. First of all, get the idea out of your head that there is going to be an explosion. It doesn't happen. The first puff from the burning gasolene fumes is the nearest thing to an explosion you will see. Of course, if you have let the cabin or some other enclosed place become filled with gasolene fumes, probably the first puff would blow the roof or floor off, but this does not often occur. If it did, you doubtless would be blown out with the rest of the dunnage.

After the first puff, it is fire, not explosion, you need fear and fight. Tanks will not explode unless empty, or nearly so, and filled with gasolene fumes, that is, vapor and air mixed. Fight the fire. Now a gasolene fire, or oil fire, is different from the ones you see the city firemen fighting with water. Water is no good in fighting a boat fire where oil and gasolene are burning. Both float on top of the water and keep on burning. In fact, the only effect of water would be to spread the burning gasolene along the bilge. Water will mix with alcohol and partly mix with kerosene, enough in both instances to dilute the inflammable liquid so it is robbed of its danger.

You'll not want it very often;
When you do, you'll want it bad:
So, when you go down to the store and set
yourself to the task of buying a
fire extinguisher for your boat,
Get the best there's to be had.

There are several things which will effectively quench gasolene flames. The law will be satisfied if you carry only a pail of sand and salt, or any one of a long list of approved fire extinguishers. All of these things will put out fire, if one has a fair chance to use them, but the trouble is that one cannot pick his hunting ground when there is a fire. Sand and salt will smother a fire if it can be covered over, but it would take a lot of sand and salt to do it, generally. Flour will put out the fire in the same manner, or sugar, and one might empty all the galley stores on the flames if need be. But one cannot keep a supply of these things for fire purposes.

The tube extinguishers, filled with a dry compound, are all right, provided one can get the compound at the fire. I remember, when a boy, seeing a demonstration of one of these, then a new invention. A flimsy wood structure, soaked with oil, was fired at the principal corner in the small town where I learned to love the water. The hero with a tube of what looked like sand put the fire out in a jiffy amid the plaudits of the rural throng. But if the fire is way down under the floor in the bilge of a boat, with a lot of pipes and wires and things in the way, it is difficult to use this type of extinguisher according to directions, which say to throw the contents violently upon the flames.

There is one thing, however, which will actually put out a gasolene fire, and it is such a safeguard that no boat owner can afford to leave it out of his equipment. That is the carbon tetra-chloride compound which is the basis of all the liquid extinguishers on the market. This, discharged close to the seat of the flames, forms a dense smoke-like gas which has no oxygen to feed the fire.

which goes out for lack of fuel. The Pyrene, J-M, Simplex and a score of others use the carbon tetrachloride mixture, with other ingredients to keep it from corroding the pump, or to add some other quality to the compound. These extinguishers cost more than the tin tubes of dry compound, or than the sand and salt, but the man who can afford to own a power boat can afford to have the necessary safety appliances to protect it.

The law compels the carrying of proper means of extinguishing gasolene flames. It is satisfied with the simpler appliances, but it is a question whether they really will extinguish gasolene flames in a power boat under conditions which ordinarily exist—and who cares to take a chance with his own life, not to say those of wife and kiddies, or even with his boat, when a few dollars will make him safe?

It should be borne in mind by power-boatmen that when it comes to inspection, the inspector may forgive the absence of any other thing than the fire extinguisher. Fines may be remitted if one hasn't a fog-horn, or a bell, or if the lights have gone out, but if the fire extinguisher is not at hand there is no excuse and no possibility of escaping the fine, because it is not permissible to remit it.

There are some things about the power-boat laws which make one smile, but this is not one of them. For instance, a fog-horn is required, but there is not a chance of ever using it according to law, for its use is not required under any possible circumstance, unless it might be when being towed in a fog, and then it is questionable. But you must have it. But with the fire extinguisher it is different. One may never need to use it, but the law calls for its presence, and it is mighty nice to know that one is protected against an emergency.

It will be seen that there are several things to do, some of them negative, to insure safety from fire, and to insure getting it out if it does occur. Keep the gas connections tight; keep the lights and sparks away from the bilge and places where fumes may be present; keep the head clear, and keep a fire extinguisher of the right sort handy. Also, keep insured.

Some Humor and a Little Tragedy

S. P. No. —— was patrolling somewhere off the New England Coast. The officer on deck sighted a vessel. A vessel of any kind always gives some excitement and breaks the monotony of patrol work. S. P. —— headed for the supposed approaching vessel and when near hailed. The new craft was ordered to lay to. A boat was lowered from the patrol and a boarding officer put on the "strange craft". The captain was ordered to produce his papers and show his license. It took some time to make the captain understand and then for the patrol boat officer to appreciate that he had boarded Pollock Rip Light Vessel.

* * *

A well-known yachtsman who happened to visit a sub-base where patrol boats are overhauled and repaired remarked "twenty boats were moored at the pier and nineteen and a half were broken down."

His listener failed to understand the nineteen and a half boats until it was explained that one boat had two engines, one of which was disabled.

This remark has, however, more truth than poetry. Engines on the patrol boats are breaking down faster than they can be repaired and the builders of the engines are kept busy furnishing new parts. In a measure some of the engine builders are responsible for this. Some engines which have been extensively boomed will run for a short time and then, being unable to stand the enormous strain put on them, weak parts will give way. Perhaps it is not altogether fair to blame the engines for all these troubles because there are few that are in the hands of competent men. Many of the engineers in the patrol boats are novices. Some have gained their rating as machinists because they have in the past run an automobile and owned a small power boat in which is an engine simple to operate. Now the average automobile man knows little about an engine. If he has trouble with his car he will stop at the first garage and have it repaired; he pays little attention to the cause of the trouble and knows less about its repair. Now that some of these men are at sea they have found out how little they do know and they are gaining experience at the cost of the Government. The base mentioned is only one of many where large fleets of disabled patrol boats being repaired can be seen.

* * *

The average yachtsman is very familiar with the waters in which he uses his yacht and for this reason the Navy Department has agreed that yachtsmen are of great value in coast patrol work, if they are employed in localities where their cruising has made them expert pilots. Sometimes, however, a man has been put in charge of a patrol boat who is not familiar with the section he has to patrol, and sometimes too junior naval officers have been placed in command of patrol scouts whose knowledge of handling small craft and of local conditions is very limited. An odd incident attracted attention to this state of affairs recently on Long Island Sound. Port Jefferson is a closed port because much Government work is being done at the shipyards in that old Long Island town. The entrance to Port Jefferson is carefully guarded and the closed zone extends from Eatons Neck to Stratford Shoal, then to Cornfield Light Vessel, and then to Rocky Point on the Long Island shore.

A well-known cruising yacht was proceeding recently from Shelter Island bound for Lloyds Harbor. The owner thought he was familiar with the Government regulations. He had passed North of Stratford Shoal Light and was heading towards Lloyds Neck, keeping West of the line, according to instructions. It was a beautifully clear day and no mistake could possibly be made in determining the lights and navigation marks. Scout Patrol No. —— suddenly headed towards the cruiser. On deck were the officers and crew and the men were standing at the guns. She carried two.

The cruiser was ordered to stop and an officer boarded her. The owner in answer to his questions said he was on his way to Lloyds Harbor, having come from Shelter

Island, and he thought he was outside the restricted area.

"You're two miles inside the area," retorted the Naval officer.

"That's Stratford Light astern, isn't it?" asked the owner.

"Yes, it is," was the reply.

"And that's Lloyds Neck ahead and that's Eatons Point to the East of Lloyds Neck as I understand it," continued the suave owner.

"No, it's not Eatons Point," emphatically declared the Scout's officer. "Eatons Point is over there," pointing towards Stamford, "and you've got to keep beyond that line."

The owner was willing to learn and he started off with his yacht, keeping in his mind that the charts are wrong and that Eatons Point is now on the Connecticut shore.

* * *

Luck often plays an important part in war just as it does in every other walk of life. A large steamer which carried troops to France not long ago was almost sunk by a torpedo discharged from a submarine, and a Divine Providence or sheer luck was all that saved the transport.

The incident, too, seems to emphasize the belief that German spies are still very active in all parts of the country. This particular steamship, in company with others, was convoyed by Naval vessels as is usual in these times. Before the fleet started each captain had his instructions, which gave him the many courses to be followed while zigzagging in the war zone and what to do in the event of a submarine attack. Roughly the zigzags were something like this: The general course up to a certain point was about East. Then the orders were to port the helm and take a course to starboard at a given number of degrees. This course was to be held for a given distance and then the helm was to be put to port again and the boat turned still further to starboard. At the end of that course the vessel was to run in a Northerly direction. In the event of a submarine attack at any time the vessel was to turn hard to starboard and run at full speed. Of course the flagship was to be followed carefully, and the flagship in this instance was a U. S. cruiser.

This transport had made the first starboard course and was nearing the end of the second starboard course when the captain saw the flagship bear off suddenly to starboard. He called the attention of a Naval officer to this move and wondered what it meant. He had seen no submarine and there had been no warning that any had been sighted or heard of. He decided quickly to "follow the flag" and the transport bore off hard to starboard. As she turned her bow cut the wake of a torpedo.

Had she held her original course the torpedo would have hit her about amidship. Had she started on the course to the North, as she was about to do, she would also have been hit, and the captain figured that the commanding officer of the submarine knew of the orders and knew that the transport was about to change her course.

No orders or signals were received from the flagship and everything after that went on quietly. On arriving in port the captain of the transport, in comparing notes with the Naval officers, asked why the flagship had so suddenly turned to starboard, and was told that she broke her steering gear and bore off through the accident, and that saved the transport and possibly the lives of many American soldiers.

* * *

A captain of an ocean liner on his voyage East reported that he received a wireless message ordering him to cross longitude —— at latitude —— and meet Scout Patrol ——, naming a well-known steam yacht, which would convoy him into port. The steamship was at the rendezvous at the appointed time but saw nothing of the convoy. He then received a second message making another rendezvous, and getting to the point mentioned again failed to find the convoy. The captain then sent out a wireless to the convoy and named a certain small island off the French Coast, which he said could easily be found, as the next meeting point. He found the island and was convoyed into port by a mine sweeper. The captain on arriving somewhat criticized the ability of the navigating officer of the patrol who, he figured, was out in his navigation and failed to find the rendezvous twice made.

There may possibly be some justification in this criticism, but in view of the experience of another ocean steamship it is possible that the wireless messages were sent out by German submarines. This second liner, while crossing the Atlantic recently, on three successive nights received wireless orders, sent in plain English, ordering the captain to cross a given longitude at a given latitude and wait for convoy. Orders to ocean steamers are now sent in code and the code changes with every voyage, so the captain of this liner smiled as he read the message and forgot it at once.

* * *

A captain of a big steamer was hustling his vessel to get out of the danger zone as quickly as possible. His wireless had received calls for help from a vessel not far astern. On the bridge he could see in the distance floating wreckage and as his vessel drew near to this wreckage he saw the body of a man supported by a life-buoy floating on the water. The man was dead. The captain, not wishing that those on board should receive a shock, had the vessel steered so that it would pass close to the body and be hidden from the sight of those on board. Just as it came near the bow a colored helper stepped out from the galley with a pail of swill which he was to throw overboard, and as this man looked down into the water he caught sight of the dead body floating face down. With a scream he dropped the swill, pail and all, and rushed into the galley. As soon as the vessel came to her pier in the city the colored man left the ship and has not since been seen.



Converted Yacht on Patrol Duty on Long Island Sound

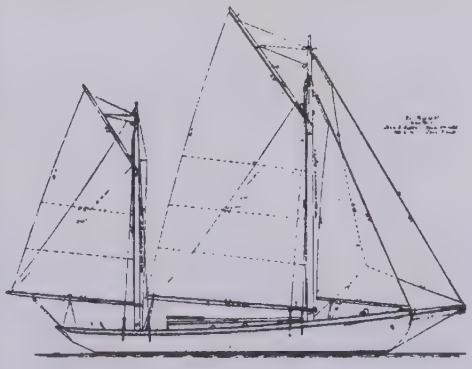
Designs

36-Foot L.W.L. Ketch

A 36-foot water-line ketch for offshore cruising was built at East Boothbay, Me., last Spring for Dr. Grenfell's Labrador Mission from designs by John G. Alden, plans of which are printed herewith. The total sail area is 975 square feet, 475 feet being carried in the mainsail, 248 feet in the mizzen and 352 feet in the two headsails. The hull is very strongly built and the vessel carries 6,000 lb of iron ballast in the keel. The accommodations, as the plans show, are very complete for a vessel of this size.

The auxiliary power is an 18-h.p. Standard engine, to which is attached a 1¼-inch Olsen kerosene vaporizer, furnished by the United States Vaporizer Company. On the run to Labrador the ketch showed her weatherly qualities in the heavy weather experienced and the engine and vaporizer also sustained their reputations. A little more than one-half the distance, about 550 miles or 75 hours of running, was done on kerosene. In this time the number of revolutions per minute increased materially. When slowed down, too, the action of the engine was just as flexible on kerosene as on gasolene.

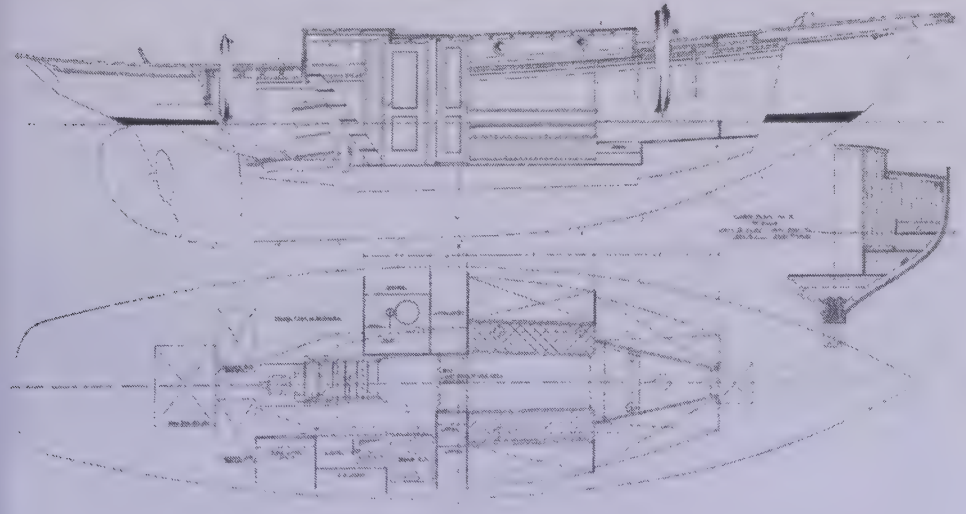
William I. Bowditch, who was on board, writes: "On the last leg of the trip in the Straits of Belle Isle a real test was made. The wind blew heavy and was dead ahead, so heavily that the boat was able to make no headway. On account of the amount of water which was constantly being shipped the companionway was closed tight. For eleven hours nobody went below or near the engine. During this entire time the Olsen kerosene vaporizer was performing its duty with absolute regularity. In summing up, it might not be amiss to state that, in the opinion of the writer, it was almost impossible to give the vaporizer a more trying test."



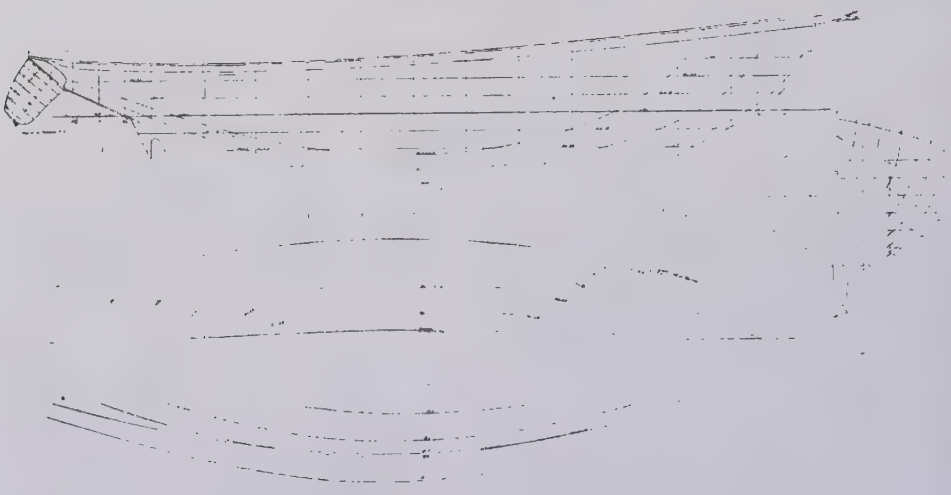
Sail Plan of 36-Foot Ketch

The general dimensions are:

Length o. a.	45	feet	0	inches
Length l. w. l.	36	"	0	"
Breadth	11	"	6	"
Draught	5	"	11	"



Arrangement Plans of Alden-Designed 36-Foot L.W.L. Ketch



Lines of 38-Foot Ketch, Equipped With Standard Engine and Olsen Kerosene Vaporizer

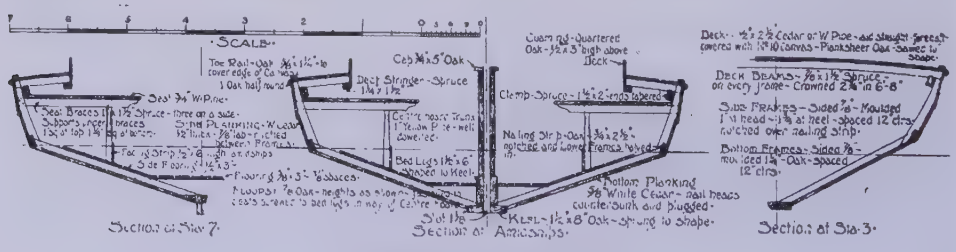
Sea Mew

While the war seriously interfered with the success of this class of boats, many have been built. Yachtsmen have written from the Lakes, from the Pacific Coast, from the Gulf and from foreign lands, saying that they were building Sea Mews, and some have written telling how well pleased they are with the boats. If there had been no war many more would have been built. Yachtsmen of Bellport and at other places had planned to build to the class for the boys to learn sailing in. They figured that such a class would serve a double purpose. The boys would learn how to handle a boat and would race on even terms and their parents would not worry about their safety, because the Sea Mews are unsinkable. They may capsize—any boat will do that at times—but the Sea Mews won't sink. Another recommendation, aside from safety, is their cheapness. It has been found absolutely necessary in promoting small one-design classes to have them as inexpensive as possible consistent with good workmanship. The plans of these boats were first published in THE RUDDER last November, but there was such a demand for that number that it was soon out of print. Because of this demand and because the boats have proved so successful, the plans are published again to meet the demands of those who have been disappointed in not being able to secure them.

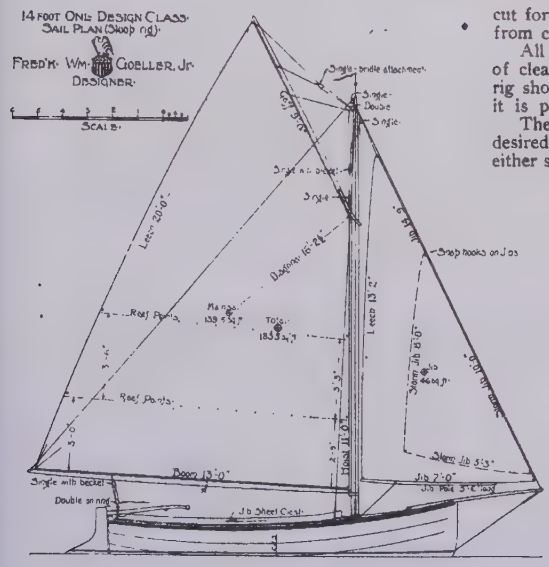
While these boats are of fairly light construction, the sides being ½ inch thick, yet with lapstreak construction it will make them much stiffer than with heavier planking of carvel (smooth) construction. The construction calls for a plank keel 1½ inches thick by 8 inches wide, sprung to shape, bottom frames sided ⅞ inch and moulded 1¼ inches of oak spaced 13 inches center to center; side frames sided ⅞ inch and moulded 1 inch at the head and 1¾ inches at the heel. They are widened out at the bottom so that the nailing strip for the chime can be let in the lower end.

In building the boat, after the moulds are all in, this nailing strip should be let in and temporarily fastened. The top edge is square, but the lower edge is not beveled off until all the bottom frames are in, so that the correct angles can be found along its entire length.

The lower edge of the bottom side plank is finished off square and the bottom planking beveled to fit this. Only by a construction of this sort can a tight job be made of the chime, for it gives a good seam to caulk with something in back of it.



Section Plans of 14-Foot Sea Mew

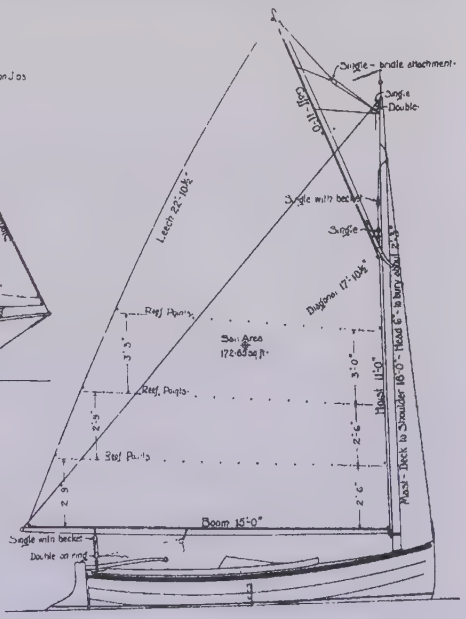


The decking is light and is covered with light canvas—which may be of two pieces with a seam in the middle—set in a coat of heavy paint on top of the wood deck. There are two or three ways of fastening the canvas around the cockpit. It may be turned down inside and the coaming set against it, or it can be tucked around the edge and a quarter-round moulding fitted in the corner against the coaming, covering the heads. The former way is the neatest and if plenty of white lead is put between there should not be any leaks along this joint. The outside edge is tucked along the outside edge of the plankshear and the edge and heads of the tacks covered with the ⅜ by 1¼-inch toe rail.

All the rest of the construction is shown plainly, the various sizes are marked and there is nothing which will offer any difficulties. The mast step extends from the centerboard trunk to the stem and the steps should be cut for both rigs so as to minimize the labor of changing from cat to sloop and vice-versa.

All the spars are of spruce—solid—and can be gotten of clear straight-grained stuff. The mast for the cat-rig should have the heart in the center for strength, as it is practically unsupported except for the headstay.

The sails may be made of 3-ounce duck, only, if it is desired to have them hold their shape, they should be either single or double bighted, according to the width of



the cloths, and to have them last, there should be a sail-cover, waterproof, to go on every night.

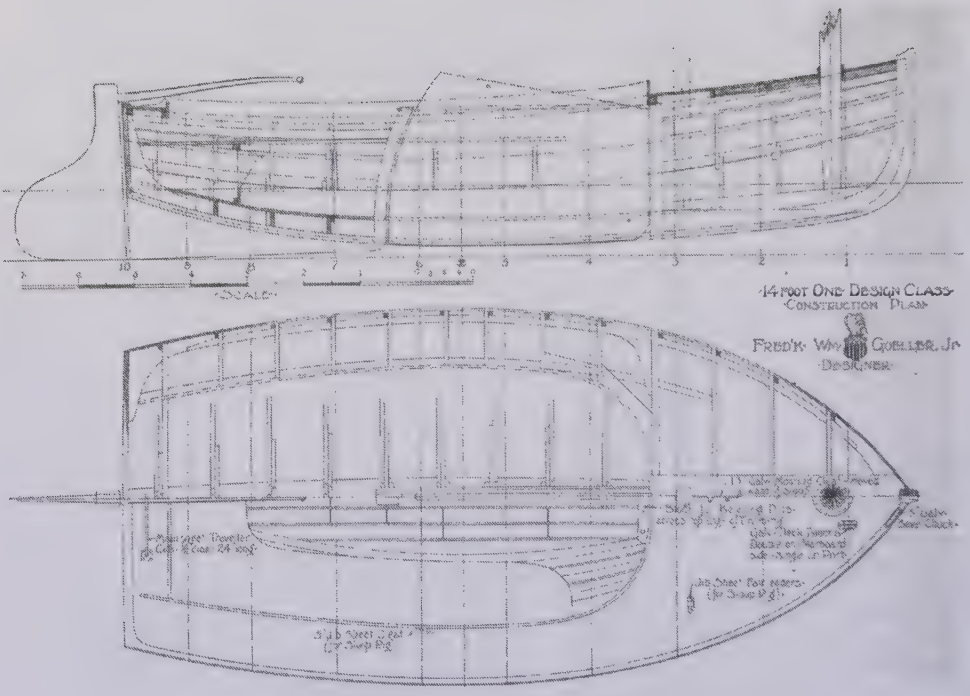
Some yachtsmen favor the cat-rig and others the sloop, so the plans show both rigs and those intending to build are able to make their choice.

	Stations.	1	2	3	4	5	6	7	8	9
Heights.	Top of Plankshear	3·2·5	2·11·2	2·8·5	2·6·6⅜	2·5·4⅝	2·4·6⅜	2·4·5	2·5·2⅜	2·6·0
	Lowe redge of Sheerstrake	2·7·1	2·3·4	2·0·5⅜	1·10·4	1·9·2⅝	1·8·4	1·9·0	1·10·1	1·11·5
	Edge of Chime	2·1·0	1·9·0	1·6·0	1·3·6	1·2·4	1·2·1	1·2·4	1·3·7	1·5·6
	Bottom of Keel	0·7·3	0·5·1	0·3·5	0·2·5	0·2·1	0·2·2	0·3·4	0·6·1⅝	0·9·1
Half Breadths.	Top of Plankshear	1·3·4	2·3·2	2·10·2	3·2·0	3·3·6⅜	3·4·0	3·2·7	3·0·6	2·10·4
	Lower edge of Sheerstrake	1·1·4⅝	2·0·6	2·7·7	3·0·2⅝	3·2·2	3·2·6	3·1·5	2·11·1	2·8·3
	Edge of Chime	0·11·0⅜	1·9·1	2·4·2	2·9·0	2·11·4	3·0·2	2·11·1	2·8·3	2·5·1⅜
	Half-siding of Keel	0·1·5	0·2·2	0·3·0	0·3·5	0·4·0⅜	0·4·0	0·3·6	0·3·2	0·2·6

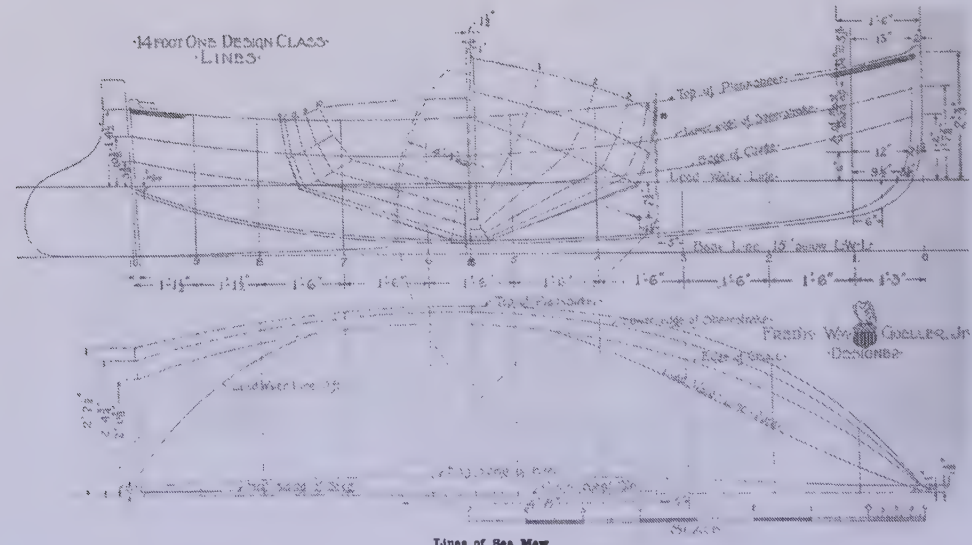
Note:—Dimensions given in feet, inches and eighths to outside of Planking—
Side Planking finished ½" and Bottom Planking ⅜" thick.
Base Line 15" Below Load Water Line.
Stem-Sided 3"

Fred'k Wm. Goeller, Jr.
Designer.

Table of Offsets of 14-Foot One-Design Sea Mew



Construction Plan of 14-Foot One-Design Sea Mew



Lines of Sea Mew

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART XI

AFTER laying out the shape of L.W.L., I can measure its width at ordinate positions and then determine the approximate stability (M.C. height) of the boat. Below I give the complete calculation.

The displacement of the boat in cubic feet is 195.7 therefore,

$\frac{816.80}{195.7} = 4.1$, the height the M.C. point is above the C.B. point.

The preliminary calculations give the following:

The C.G. point is located 1.02 foot above the L.W.L. plane.

The C.B. point is located .66 foot below the L.W.L. plane.

Therefore, the C.G. point is located 1.68 foot above the C.B. point and by deducting 1.68 from the distance the M.C. is above the C.B. point we get 2.34; 2.34 feet is, therefore, the M.C. height, or the distance the C.G. of weight could be raised without the boat becoming unstable. This measurement is ample for a boat of this type and size.

The next part of the preliminary work is to roughly outline the shapes of cross-sections and water-line planes. The section shapes are laid out by first of all selecting the shape of midship section and then working from it (forward and aft) and laying out each successive section. It is important when doing this preliminary work to make each section exactly the area found necessary by laying out the curve of areas. The shapes will, of course, have to merge into that selected for the midship section, and in laying out this section the designer's idea of form must be kept in mind and sections shaped so that these ideas of form will predominate. After sections are laid out, the water-line planes shapes are marked. These are laid out from measurements taken from sections, and when laying them out, it will always be found necessary to make some changes in shapes of sections, because it is never possible to get both longitudinal and vertical shapes correct and fair at the first attempt.

The principal thing to remember is to keep the areas of cross-sections as near as possible to the curve of area measurements. On drawing I show cross-sections and water-line planes laid out and on each I have marked the approximate area. You will note that areas conform with those given on curve of area. The preliminary calculations are now completed and the last work is to divide the interior into its principal divisions and lay out the approximate shaft line. This is usually done by marking dotted lines on profile view, the designer using his judgment as to their locations and making sure that sufficient room is left both for the propeller wheel to revolve in solid water and for the engine to be installed. On the preliminary drawing these lines have been marked. This covers the preliminary calculations and drawing, and if the drawing is made to the same scale that will be used for working drawings, it will be an easy matter to use preliminary drawing for a guide and transfer measurements from it direct to other drawings. Designing the Lines follows this.

Designing the Lines

When the preliminary drawing has been approved, you can begin work on the actual design.

When designing a boat, or vessel, the first drawing prepared is the one that shows the *form*, or shape, in sufficient detail to enable the builder, or the user of the plans, to shape the boat in exactly the manner the designer wants it shaped.

The Lines Drawing.—This drawing, and, in fact, all original drawings, should be made with a very hard

Calculation to Determine Area, C.G. and M.I. of the L.W.L. Plane of Fig. 42. Also M.C. Height Preliminary Calculation

Ord. No.	½ Ord. Lengths	S X	Function of Length	M X	Moment	Cube of ½ Ord.	S X	Moments
1	0.00	1	0.00	0	00.00	00.00	1	00.00
2	1.16	4	4.64	1	4.64	1.35	4	6.20
3	2.40	2	4.80	2	9.60	13.82	2	27.64
4	3.40	4	13.60	3	40.80	38.80	4	155.20
5	4.04	2	8.08	4	32.32	65.95	2	131.86
6	4.12	4	16.48	5	82.40	69.92	4	279.68
7	3.88	2	7.76	6	46.56	58.93	2	116.78
8	3.33	4	13.32	7	94.24	36.89	4	147.56
9	0.00	1	0.00	8	00.00	00.00	1	000.00
			68.68		310.56			864.92
					4.25 Interval			.33⅓
					1,319.88 Moment			288.30 ⅓ Cube
								1.416° ⅓ Interval
One-third interval			1.416°			Half M.I.		408.40
Half area			97.29 square feet					2
			2			Whole M.I.		816.80
Whole area is			194.58 square feet					

$\frac{1,319.88}{68.68} = 19.21$, the distance in feet C.G. is aft of No. 1 Ord.

pencil (6 = H =) on a piece of good quality, close-grained drawing paper. The lines must be drawn evenly and neatly, therefore the pencil must be kept sharp.

Selecting the Scale

Any desired scale can be selected, but it is well to select one that is sufficiently large to enable accurate measurements of the lines to be made after drawing is completed.

Having selected the scale, determined the length and width of paper necessary, and having fastened it to the board, you are ready to begin work.

First decide where, on the paper, the different views will be located. One of these positions can be selected:

1st. Profile at bottom, W.L. above profile. Diagonals above W.L. Body plan in center of diagonals, using the midship ordinate as center line.

2d. W.L. at bottom. Profile above W.L. Body plan at center of profile, using the midship ordinate as center line.

3d. Either of the above, but having body plan at one end of drawing and on a line with profile view.

The third plan will probably be the best to select for your first design.

Having decided upon positions, transfer the outline shape of boat shown on preliminary drawing to paper on board.

The preliminary drawing shows approximate shapes only, therefore, if by altering a line you can improve the appearance, speed, safety or utility of boat, make the change. As designer it is your duty to do your best. The best and quickest way to transfer is to take measures along ordinate lines marked on preliminary lines drawing and transfer them to corresponding ordinate lines on drawing paper. If the scale of your preliminary drawing is the same as lines drawing scale, you can transfer measurements by using dividers, but if the scales are different, it will be necessary to use two scales, one for preliminary drawing measurements and the other for lines drawing measurements, or a pair of proportional dividers.

When transferring measurements make small dots at points where measures reach, then bend a batten to cut the dots, look along it, see if line looks fair and in accordance with your ideas, correct if necessary, and then mark the line. From now on each line must be drawn as accurately as possible.

Transfer outline of profile view first, then mark rabbet line from about No. 2 ordinate to sternpost. The remainder of rabbet cannot be marked until after water-line shapes are laid out.

Next transfer the deck and water-line measurements and mark their outlines, and when this has been done measure and transfer the midship and other cross-section outlines.

It is important to remember that while the shape of both the L.W.L. and midship section can be changed, their *area* should not be.

The curve of area should next be transferred and faired. The displacement and number of cubic feet of bulk the underwater body must have, has been determined by means of preliminary calculations, and as the preliminary curve of area illustrates your ideas of longitudinal distribution of this bulk, you must now definitely determine whether this distribution and the selected position of C.B. point is correct. Correct longitudinal distribution of bulk is most important. A design may look perfectly fair, the lines may look true to the eye and yet the boat may have an undesirable fore-and-aft distribution of displacement and be hard to drive.

The principal points to keep in mind when laying out a curve of areas are:

1st. To make the curve fair from end to end.

2d. To shape the curve so that the areas of successive sections, from bow to midship, will increase in correct ratios and the areas of the afterbody sections will decrease in relatively the same proportion.

If the afterbody curve does not balance the forward body curve, the boat will be hard to drive and will have a tendency to alter her "trim" when driven at speed.

To explain this, suppose that a certain boat is at rest floating in still water. Her displacement is known and she floats to her designed water-line. Now suppose she is moved forward. As she moves the forward body forces particles of water, that impede its motion, out of the way, and in doing this, some motion is imparted to the particles of water adjacent to hull. As the boat advances the water moved aside by the forward body flows into the cavity left by the advance of the after body and the movement of water is along the lines of least resistance,—under and around the boat. If, owing to improper balance between forward and after bodies, or to improper fore-and-aft distribution of their bulk, the water moved by bow cannot flow freely into and entirely fill the cavity left by stern sections, then the boat will be hard to drive and if driven at sufficient speed, will change trim, or "squat" until by the alteration in trim the balance is equalized; in short, particles of water put into motion *must* flow into the cavity left by stern with sufficient rapidity to *keep the stern full supported.* If the water cannot, because of improper shape and distribution of bulk, flow into the stern cavity as freely as it should, there will not be sufficient water support under the stern to keep the boat on a proper water-line and she will "squat" or sink in water at the stern, until buoyancy support under stern is sufficient for support; i.e., the boat will fill that portion of cavity into which the water cannot flow rapidly enough.

If any change is made in the curve of area, now is the time to correct cross-section areas and make them conform to the new curve of area measurement; and remember that any change in a cross-section measurement necessitates that the corresponding measurement on water-line view must also be changed, and this again will necessitate an alteration in shape of one or more water-lines.

When all section shapes are fair and their measurements the same as those of water-line planes, remeasure the section areas and make sure that they correspond with curve of area measurements. If they do not conform to them, make the necessary changes, because *the section areas must be the same as the curve of area measures.*

The lines can now be faired.

Fairing the Lines

This is done by marking buttock and diagonal lines on cross-section view and from measurements taken from these curves that serve to illustrate the fairness of the whole form can be laid out.

To attempt to get all lines fair by means of measurements taken at right angles to each other would be an extremely lengthy proceeding, because there is no means of indicating which of two lines is the incorrect one.

But if three lines of measurements are used the incorrection can be quickly located, and then if one more

line of measurement, taken at a different angle, is used inaccuracies can be very quickly located and corrected.

Buttock and diagonal lines are used for this purpose.

Buttock lines show the shape of a boat if it were cut through longitudinally at certain, marked, distances from its center.

These lines are located any desired distance from center line of boat and any number of buttock lines can be used. The more there are the easier it will be to fair the lines.

For a small boat two buttock lines will be sufficient, the first being located 18 inches out from center line and the second 18 inches away from the first one. (See dash lines on Body and Water-Line Views, Fig. 42.)

Buttock Lines

Buttock lines show as straight lines on the half-breadth and body plans, and as curved lines on profile view. The straight lines are drawn first and then the curved ones are located and drawn by transferring measurements taken from the straight lines, bending a batten to the marks and drawing the lines. First mark the straight lines on half-breadth water-line view by measuring the desired distance out from center line marking points and drawing straight lines parallel with center line and extending from outline of deck forward to outline of deck, or transom, aft. Next mark the straight lines on body plan by measuring the same distances out from center line and drawing straight lines from base to sheer parallel with center line.

Next transfer the measurements to profile view and mark the curved lines.

To do this proceed as follows:

Place T square head against edge of drawing board and move it until one edge of T square blade touches the point where a straight buttock line on half-breadth water-line view touches the outline of deck, then draw a very light pencil line from this point to sheer line on profile view. The point where this line touches the sheer line is where that particular buttock line terminates at sheer on profile view. Now move T square along and transfer, in the manner explained above, the points where each straight buttock line crosses each curved water-line marked on half-breadth water-line view. The transfer is made by drawing light lines down from curved water-lines of half-breadth water-line view to the correspondingly numbered straight water-line plane on profile view.

When all points of crossing are transferred, you will have marked on each water-line plane of profile view a series of points, but as these points are not sufficiently close to enable the curves to be accurately drawn, some additional measurement points must be transferred from body plan. These measurement points are obtained and transferred in this manner: With a pair of dividers measure the perpendicular distance on body plan between base line and point where each section outline crosses the straight buttock lines, then transfer these measures to the proper numbered ordinate line marked on profile view by placing one end of dividers on base line of profile view and the other on proper ordinate line. The point where divider touches is the exact place where buttock line being transferred should cross the ordinate.

Measure and mark each point. The spline is then bent to cut the points and held in place with weights, and as much of the line as possible is drawn. The ends of the line (where the curve is too abrupt for the spline to follow it) is completed by using curves.

Bear in mind that *buttock* lines must cut each measurement point. In case a point is out go over the measure again and find out mistake before you draw the line.

All buttock lines are transferred and drawn in this manner.

After the buttocks have been drawn the *diagonals* can be transferred. These lines show on body plan as *straight* lines standing at varying angles, and on the half-breadth water-line view (above it) as long curved lines. They do not show on the profile view.

The diagonals show lines along which the water will pass *under* and around the hull. Their chief use (as marked on the drawing) is to aid the designer to fair water-lines and sections.

Locating the Diagonals on Body Plan

Imagine what the shape of underwater body is like and draw the straight diagonal lines at angles you think battens will take when bent around the boat from bow to stern.

Three diagonals are suggested as being sufficient for fairing a boat of this size.

The diagonals on body plan begin at some point on center line and extend down, at the desired angles, until they reach the *base* line. By extending diagonal lines to base it makes it possible to measure out, along base, from center line and thus get accurate measurements for transferring diagonals from one-half of the body plan to the other. *It is absolutely necessary to have diagonals marked on both forward and after body stand at identically the same angles.*

After the straight diagonal lines have been marked their measurements must be transferred to position where the diagonal curves will be laid out. This position is usually above half-breadth water-line view, the center line of that view being used for center line of diagonal curve view.

To lay out diagonal curves locate the points where the diagonals will terminate at bow and stern. These points can be found by measuring on the body plan the distance from base line to points where diagonals *intersect with rabbet line marked on that plan* and transferring each measurement to the profile view *rabbet line.*

The points can then be transferred from profile view up to the place where diagonal curves are to be laid out, the marks being made *the exact half-breadth of keel distance above center line.*

After the points of termination have been marked, which you must remember are not at center line, measurements for transferring from cross-section to diagonal curve position can be made.

To do this measure *along* each diagonal line marked on body plan the distance from center line to where the line intersects with a section outline and transfer measurement to proper numbered ordinate line laid out for diagonal curves.

Complete the measurements for one diagonal, transfer them, then bend a batten to cut the points. If the curve looks fair from end to end the line can be marked, but if it is not fair then batten must be moved from the unfair points until curve is fair from end to end.

Mark the line when fair and then remeasure and transfer back to body plan any measurement that has to be corrected.

After all the diagonal curves have been marked, the sections must be faired to corrected diagonal curve marks, and then the water planes must be corrected to correspond with the changes in section shapes. When

all corrections have been made the forward and after ends of rabbet line can be marked on profile view.

To do this transfer from half-breadth water-line view the points where each water-line crosses the half-breadth of keel line (the rabbet). These must be transferred down to the *profile* view and marked on their corresponding water plane. Then when all points are transferred a batten can be bent, or a curve used, and shape of rabbet at ends completed.

The lines drawing is now complete and you can obtain from it measurements for the calculations mentioned below.

Calculations You Must Now Make

Measure the lines drawing and make the following named calculations:

Areas of Water-Line Planes and Sections.
Volume and Displacement of Underwater Body.*
C.B. Position Vertically and Horizontally.
The M.I. of the L.W.L. Plane Around Both Transverse and Longitudinal Axis Drawn through C.G. Point of Plane.
The Transverse and Longitudinal M.C. Heights.
The Transverse Righting Moment at 10, 20, 30 and 40° Inclination.
The Volume of the Abovewater Body of Boat.†
The Center Point of this Volume (above).
The Center of Lateral Resistance.
The Area of Immersed Surface.
The Power Required to Drive Boat at Named Speeds in Still Water.
The Coeff. of Displacement, Prismatic Coeff., L.W.L. and Midship Coeff.

The *lines* drawing when completed shows these views:

Profile view.
Half-breadth water-line view.
Body, or cross-section view.
Diagonal lines. Buttock lines.

Measurements taken from all these views should correspond with each other and the area of L.W.L. plane and midship section, as well as the displacement, and curve of areas should be identical, or almost so, with those selected when you made the preliminary drawing.

In the next issue will be shown the completed Lines Drawing of Boat being designed, and on it I will mark numerals that will enable you to quickly identify each line on the three views.

Before proceeding further I will briefly explain a few things that must be considered when planning construction details of small power boats.

1st. The materials selected must have sufficient strength to withstand all stresses and strains the boats will encounter.

2d. The materials must be durable and not liable to rot when partially or fully immersed in water.

3d. The pieces must be shaped and fastened together in such a manner that the structure as a whole will have a maximum of strength without unnecessary weight.

Unnecessary weight is a detriment and detracts from the strength of any structure.

Always remember that strength of a structure is never greater than the strength of its weakest part.

If, when designing the structure of a hull, you make one part unduly weak, the whole structure will be weak and no amount of strength added to other parts will make up for the weakness of the one weak piece.

As I have in a previous chapter given tabulated dimensions of material and relative value of material lists, it will be unnecessary to do more than refer you to those lists for data about suitable sizes and kinds of materials to use.

Therefore I will pass to the third item.

The strains to which boats and vessels are subject can be divided into two classes.

1st. Structural strains, or strains that affect the structure as a whole.

2d. Local strains that affect some particular portion of the structure.

Structural Strains

These are almost entirely due to the action of elements (weather and sea) or to propulsion (sail, steam, power).

Longitudinally a power-boat hull may be likened to a trussed girder, subject to bending in a fore-and-aft direction, but as the distribution of weight and amount of material used in the structure varies considerably along the length, and in addition to this the water support, or buoyancy due to the up pressure of water, is not evenly distributed along the length and does not coincide with weight distribution, the strains are very unevenly distributed.

Imagine that a boat has been cut transversely into four pieces, and that tight bulkheads have been fitted at the ends of the pieces; the pieces being joined together again in such a manner that they will be free to move up and down, but in no other direction. Also suppose that weight of boat has not been increased. If, after cutting, the boat is replaced in water, it will be found that each section will now float at a level *determined by its weight and the up pressure of buoyancy on that particular section.* Or, in other words, weight and buoyancy will determine the level of flotation of each section independently. Thus the sections will now float somewhat in this manner:

Bow section has least buoyancy (bulk) and the materials used for stem, etc., are in excess of buoyancy requirements, therefore, this section will float deeper than the original water-line.

Next to bow section has a large amount of buoyancy and no excessively heavy weight to carry, therefore, this section will float above the designed water-line.

Midship section has great buoyancy, but also carries a large amount of weight due to machinery, etc., therefore, this section will float deeper than the L.W.L.

Stern section has no excessive weights to carry and its buoyancy is greater than is required to float weight, therefore, this section will float higher than the original water-line.

Thus we have two sections striving to float higher, when boat is rigidly connected as a single structure, and two striving to sink deeper, and these opposing forces will cause structural strains that must be considered and be taken care of by the designer when he designs the structure.

To equalize structural strains of hull and buoyancy of water along the length of a boat is an impossibility, therefore, the strains must be carefully calculated for both the level water-line, as shown, and also for the extremes of fore-and-aft pitching likely to occur when

* This must be calculated by both planes and sections.

† This should be calculated to a line drawn parallel with L.W.L. and cutting the sheer at its *lowest point*. It is not necessary to include in this calculation the portion of sheer above this line.

boat is in a sea. This brings me to a point where it is necessary to consider the abovewater portion of hull.

The Abovewater Portion of Hull.—The shape of this has a great deal to do with the action, or behavior, of a boat in a sea. Its shape can either increase or decrease structural strains.

The ideal shape for the abovewater portion of a hull is one that will permit the bow to settle easily up to the proper (calculated) point, and will prevent the stern from settling when bow is lifted out of water.

These conditions are obtained in a power-boat hull by giving the extreme bow sections above L.W.L. a gradually increasing flare and by making the extreme after sections above L.W.L. relatively full.

The strains that affect the frame of a boat are partly transverse and partly longitudinal and for the purpose of helping you understand this I tabulate below the names of a few principal parts of a boat's frame and have entered against each the kind of strain that it must be designed to resist. To offer greatest resistance to longitudinal strains the pieces affected must have their greatest strength longitudinally and vertically, while to offer greatest resistance to transverse strains the strength must be transversely and vertically.

I say pieces, but in reality both the pieces and the structure as a whole have to be considered, because it stands to reason that the shape of the whole structure must greatly influence its power to resist strains, and consequently the amount of strain that each piece has to bear. For instance, if a hull is shallow, that is, if its depth from keel to sheer is slight in proportion to length, the structure as a whole cannot offer very great resistance to longitudinal strains and, therefore, in such hulls the pieces which have to resist longitudinal strains must be much stronger vertically than in hulls of the same length but having a greater depth.

The same rule applies to transverse strains, though in this case width must be considered instead of length.

Part of Frame	Longitudinal Strains	Transverse Strains	Both Equal
Keel stem, etc.	Greatest.	Least.	
Deadwood log, etc.	Greatest.	Least.	
Bilge clamps.	Greatest.	Least.	
Deck clamps.	Greatest.	Least.	
Ribs and floors.	Least.	Greatest.	
Deck frame.	Least.	Greatest.	
Shelf and knees.	Least.	Greatest.	
Bulkheads.	Least.	Greatest.	
Planking, decking	.....	.....	Both equal.

The Keel.—Longitudinal strains are greatest, therefore, the most effective form of keel is one having depth greater than thickness (width).

Stem and Stem-Knee.—These can be considered as part of the keel and should be designed to resist longitudinal strains.

Deadwood and Shaft-Log.—These can also be considered as parts of keel and should be designed to resist longitudinal strains. The log must also be made sufficiently large to permit shaft hole to be bored through it and fastenings placed correctly.

Ribs should be designed to resist transverse strains. A rib having greater depth than width and placed with narrow face against inside of planking is the most effective.

Floor Timbers.—While these aid in resisting both transverse and longitudinal strains, they should be designed to offer greatest resistance to transverse strains. Depth above keel helps to resist longitudinal strains and length of arms each side of keel is necessary for transverse strain resistance. The correct shape of floor timber is one having good depth above keel and good length of arms each side of keel.

Clamps.—Longitudinal strains affect these most, therefore, clamps should be placed with a view to resisting longitudinal strains. Their depth should always be greater than thickness and deep face should be laid against inside of ribs.

Deck Frame should be designed with a view to offering greatest resistance to transverse strains. The ends should be securely kneed and fastened to both clamps and ribs.

Planking.—The side and top planks help to resist longitudinal strains and the bottom ones transverse strains. The strength of planking should be ample to resist the hull and structural strains, and, in addition to these, the strains due to action of sea and *pressure* of *water* due to depth of immersion (see table of water pressures). The planking must also be thick enough to hold the caulking in seams, and the caulking must also resist the water pressure strains. Remember that at, and near keel, the pressure is considerable and this extreme water pressure must be considered when designing planking construction details.

Bulkheads.—These can be considered as solid ribs and, therefore help to resist transverse strains. Watertight bulkheads must always be strong enough to resist pressure of water that will come against them if compartment ahead of them is *full* of water and open to the sea.

Remarks About Local Strains.—Strains of this nature are mostly due to the placing of some heavy weight, such as engine, boiler, mast, etc., in the vessel or boat; or to the action of engine when operating, or to the action of propeller, or to strains due to force of wind on sails, or to strains caused by rigging attachment.

All such local strains must be carefully considered by the designer and taken care of by adding strength to the structure at the points affected.

Thus, local strains due to weight of machinery and to *its operation* must be taken care of by adding proper foundation structure and strengthening the parts of structure at and near to the machinery. It is necessary to bear in mind that any strengthening of structure should be made in such a manner that the strain is transferred to the main portions of hull structure and *spread* over as large an area as possible.

The action of a propeller will cause strains that can best be taken care of by adding strength to deadwood and sternpost. Always bear in mind that provision *must* be made for taking care of the thrust of propeller.

In sailing craft, local strains due to weight of mast, etc., must be taken care of by strengthening the keel where mast is located and by adding foundation timbers for mast to step into. The deck where mast goes must also be properly strengthened and all places where rigging is fastened to hull must be properly strengthened to resist the greatest strain that will be put on the sails and rigging. The details of hull strengthening for rigging attachments must be carefully worked out for the express purpose of transferring strains over the greatest possible surface of hull.

It is most important to bear in mind that it is wasteful and unwise to attempt to obtain necessary strength by simply adding weight of material. The strongest and most durable structure is always the one in which *weight, distribution and fastening* of the materials have been considered as one connected whole.—A sufficient weight of material must be used and this material must

be properly placed, distributed and fastened; but any excess of weight over and above what is absolutely necessary generally detracts from the efficiency of the structure as a whole. No structure is stronger than its weakest piece is a most important maxim to remember.

It is especially important to remember that fastenings are just as important details as the largest member of a structure, and, in fact, it can be said with truth that fastening details are more important than many that receive more attention.

(*To be Continued*)

The Question of Buoys

ALTHOUGH buoys are about the first aid to the navigation or piloting of a boat, many skippers make the general sum-up of red to starboard and black to port and let it go at that. Many more are not dead sure which side the buoy is supposed to be passed, and just take a chance and sail serenely on; buoys being the least of their worries.

To really understand buoys is to really understand chart reading, and with such knowledge the skipper not only knows on which side the buoy should be passed, but also understands the reason for their being there.

Such knowledge also makes it often possible to safely save many a yard by not having to take the longer route out around some point or spit, when once a knowledge of the bottom and the reason for the buoy being there is understood.

The Government rule for buoys is that black buoys with odd numbers are placed on the left side of the channel and should be left to port (left side of boat) when entering; red buoys with even numbers are placed on the right side of the channel and should be left to starboard (right side of boat) when entering. Now right here is where the skipper or pilot should know whether he is entering, or about to enter, to safely use and interpret this rule.

By intelligently using the Government pilot book, or by carefully reading the chart for waters being sailed, the skipper need take no chances as to the passing and direction of the buoys.

On some of our large waters having more than one channel, and where other streams and buoys meet, buoys placed to mark their respective waters become a maze without a chart. Where such waters have rocky bottoms, navigation is a dangerous matter, even with a light draught boat. There are times when every red buoy cannot be passed to starboard nor every black to port. In other words, the skipper must know if he is entering or leaving and then use the buoys according to rule.

As an example, as you sail East on Long Island Sound, you find a black buoy off Sands Point which you pass to starboard (right side of your boat) because you are leaving port and not entering. (Remember, buoys have no port nor starboard.) A black bell buoy off Prospect Point you pass likewise. If you still hold the shore and turn into Hempstead Harbor you pass red buoys to starboard, because you are now entering. Suppose you are at New Rochelle and as you pass out of Echo Bay, you will have a black (lighted) buoy on your starboard and a red buoy on your port. If you hold to the shore for about half a mile you will come to a black buoy off Premium Point, which should also be passed to port, because this buoy is an entering mark for Larchmont. To safely use the rule for passing buoys, a study of the chart must be resorted to in order to know whether you are entering or leaving, and to understand why the Government has gone to the trouble and expense to place a mark there.

The black and red horizontal striped buoy should also be understood. Although called a danger buoy and generally used to mark an obstruction such as a wreck or a rock having good water on all sides (Morris Rock, Huntington Bay, L. I., as an example), there are times when this is not the case and a knowledge of the obstruction should be had. This buoy is usually given a good clearance, but as it is also used to mark the end of a bar or shoal with a waterway on either side, the direction of the shoal must be understood in order to pass the buoy safely, regardless of the clearance given.

As an example, Hedge Fence Shoal (Nantucket Sound) is marked at each end with a black and red buoy. When sailing North these buoys are not supposed to be passed on either side; likewise the black and red buoy marking the Eastern end of Middle Ground Shoal (Vineyard Sound) is not to be passed on either side unless sailing about East, or in other words parallel with the shoal.

This buoy is used in many places in Southern sounds to mark the end of the sand-bars at the fork of the rivers, having channels on each side of the bar which lead into the rivers. These places are "foolers" to boatmen or skippers who are navigating these waters for the first time, as the bars make way out into the sound. The buoys can be passed on either side when the course leads up the river, (say the course is West), but cannot be passed on either side when running across the sound (say course is South).

No doubt to many the easiest buoy to understand is the black and white channel buoy, which has black and white perpendicular stripes and is placed in mid-channel and passed close to on either side when entering or leaving. White buoys usually mark a designated line of anchorage where traffic is heavy and channel waters are limited. White buoys are also used to mark mine fields, etc., in times of war.

Yellow buoys are used as quarantine marks and usually placed near one of their stations.

There are several different types of buoys used by the Government to mark our waters and each type is selected for its special requirements and placed where to be most in service. Main channels in large ports are usually marked by nun and can buoys, with secondary channels marked with spar buoys or second class can and nun buoys. The numbering enables one to locate or fix his position when in doubt or in a fog, and should not be overlooked when such is the case.

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

14-Foot Sailing Dinghy

ditor of THE RUDDER:

I am sending to you a photograph of my new 14-foot iling dinghy Eaglet, designed by Erland D. Debes and ilt by James E. Graves at Marblehead. The designer llowed the lines of the Almira as far as practicable in small a boat, modifying them to conform to the dinghy pe. The boat proved fast and able. She has 165 uare feet of sail, a metal centerboard, 200 lb of lead her keel, a self-bailing cockpit and large lockers fore d aft.

Maine. E. K. BUTLER.



14-Foot Sailing Dinghy Eaglet

Owner—Designer—Builder

The editorial under this head in THE RUDDER for igust has brought out many letters, some of which e published in this number. The subject is a very com-ehensive one, embracing a number of important points, d each individual reader has naturally dealt with that rticular point which appealed most directly to his rsonal interests. The one vital point is that of the designing of a new yacht fleet: is this fleet to be built up by chance, following a variety of whims and fancies for naval and commercial types, or are American designers prepared to create a new yacht type based on all that has been learned in the past; the investigations of scientists and the experience of naval architects in the matter of form, the traditions and usages of the old-time shipwrights in the matter of appearance and ship-shape style, and the great advance of the engine men in propulsive mechanism?

The evidence is multiplying day by day that in the event of a reasonably speedy and satisfactory end of the war there will be a demand for a new yacht fleet that will tax the energies and resources of both drafting rooms and shops. Just what part sail may play in this revival is a matter of doubt under present conditions, but it is safe to say that the great majority of the new fleet will be power craft of cruising type, in size from 30 feet upward, and propelled by some form of internal-combustion engine. There are now afloat some examples of good design in all types and sizes, and many, many more of bad design: which will prevail as the model for the new fleet?

The order of the day in every branch of naval construction is revolution and evolution—new models and new methods of construction for commercial vessels and new systems in yard operation; will the yacht-builder be able to improve upon his old plant and his old methods?

The manufacture of yachts after the method of the automobile, though necessarily on a much smaller scale of production, is likely to figure to a certain extent in the future; but its possibilities are limited. The one advantage is the reduction of cost through the multiplication of one stock design, and this may be done in certain cruising power yachts of moderate speed and up to 50 feet length or so, the demands of the majority of users of such craft being comparatively standardized. It will be found, however, that the individuality that has always characterized the sailing yachtsman still exists, and the great demand will still be for yachts designed and built to suit each owner. The problem, then, is to retain this individuality in harmony with the laws of naval architecture and at the same time to build at a cost which will be fair to the builder and yet will promote the increased use of yachts.

Editor of THE RUDDER:

I will gladly respond to your favor as requested, to give my opinion, how to make America the leading ship-builders and owners in the world and my experience in naval sport and ship-building in other leading naval countries.

In naval matters, I am a sportsman, and for me there is only one sport on the water, and that is "Sailing". Meantime I have had the pleasure of traveling over the water, from hydroplane, fast power boat to 50,000-ton

steamer; but this I call temporary excitement or comfortable travel; the sport for the general public lies only in the sailing boat.

The first step to make naval sport popular, and to encourage ship-building, small and large, is to organize and subsidize boat races by the Government, State and County, and offer valuable trophies with big cash prizes connected for the fastest sailing boat of all classes and dimensions, and same for gasolene and steamboats.

Organize annual or semi-annual exhibitions, and encourage making correct models of all kinds to be bought by Government, County and State for exhibition in museums, colleges and libraries.

America, leading in overland transportation, should be able now to become leader also in naval transportation.

Here on the West Coast we have made the great start in wood ship-building, the most practical and best start we can make here, although I believe in the future we will apply the practical combination of steel and wood.

For propelling, the latest improvements applied to steam engines produced by oil-burning process seem to me the most practical and sure; electricity, not yet firm, too unreliable; and gasolene engines originated and adapted more where space was the first consideration. Finally, give full power and authority to experienced men on the subject—men like Theodore E. Ferris in the East, and Fred A. Ballin in the West—and I believe our work is as safe and sure as we can lay it out.

Hoping my views will be of some value on this subject for your valuable paper, and others interested, I remain,

Spokane, Wash. DANIEL H. MIDDLEBURGH.

* * *

Editor of THE RUDDER:

I read with interest and satisfaction your editorial on "Owner—Designer—Builder of Yachts", and agree most fully in what you say.

It really is almost a sin that the money, material and labor that is put into some crafts, and which turn out to be monstrosities, could not have been spent along lines of beauty and grace at no greater expenditure.

I think you should continue to write on these lines, even at the risk of being accused of harping on the subject.

A great many of our yachts are like a great many of our bridges in this country—practical and of utility to serve the purpose, but lacking entirely in that beauty which one finds in European bridges, which have every bit as much utility but have not sacrificed architectural beauty.

Chicago. H. H. WINDSOR.



Apache, H. H. Windsor, Owner; 90 Ft. Long, Equipped With Two 6-Cyl. 6½-In. by 8-In. Sterling Engines

Editor of THE RUDDER:

I was interested and concerned after reading your letter of the 30th of August last.

I am one of the rapidly diminishing few who still stick to sail only, and am depressed at the vision of the not-far distant day when yachting will have become so denatured that all the yachtsman need do is sit in the rocking-chair fleet and, by pressing a button, send his yacht out to race or cruise, as unattended as the modern torpedo.

Steering a boat propelled by an engine is not yachting, and can hardly be called a sport.

What is needed is educating the younger generation—the boys—in the sport, and giving them a modern, safe and inexpensive boat, to take the place of the old barn-door-rudder catboat which their forebears started with.

The designing and building of such a one-design class of boat in large numbers from standardized designs would make available a long-needed craft, which many men who still have traces of true yachting blood would gladly buy for their sons. I have in mind the small Larchmont one-design class.

These boys, too young to enter the Army and Navy, but with the red blood coursing through their veins in these stirring times, will be in just the right psychological state to learn a sport as fine as sailing. So, I say, design a boat of wholesome model; enlist the yacht-building concerns in putting it on the market at a reasonable price, depending on the number ordered; advertise the same, and get the fathers and sons interested, and thus start the campaign of reestablishing the finest of all sports, sailing.

New York. SAMUEL B. COFFIN.

* * *

Editor of THE RUDDER:

Your fatherly talk to "Owner, Designer, Builder", covers more ground than I can walk on within the limits of this country, and will, I hope, awaken yachtsmen to the fact that a yacht is not a houseboat, a sea plane, a torpedo boat, or a coast patrol, and should not be modeled after any of them. It should be a safe, fairly speedy and comfortable floating house for the man or woman who seeks recreation on the water. The evolution of a type in accordance with such requirements should be the first thing to do in the building of the fleet that is to come after the war. Such a type, with such modifications of beam and draught as local waters might require, might be adopted by all builders, and then they could plan the interior to suit each owner's idea of accommodation and comfort. If designers and builders are inspired by the purpose of turning out safe, fast and comfortable boats, each one to be finished in accordance with owner's wishes, we would surely have a fleet that would hold all lovers of the glorious sport, and draw with them many thousands of recruits. There seems to be no reason why yacht-building should not be standardized, with facilities for the modifications called for by different designers and owners, thereby greatly lessening the cost of pleasure craft. Your strictures will, it is to be hoped, lead to this desirable result.

Chatham, N. B. J. L. STEWART.

* * *

Editor of THE RUDDER:

If I get the meaning of your editorial, it is to get at the thing required to stimulate and sustain interest in yachting, *i.e.*, sailing from design, racing, cruising, handling, care of upkeep, etc.

A large question, of course, but I think one matter that would have a very general appeal would be a modification of the "Universal Rule", to first remove the penalty on quarter-beam measurement sufficiently to permit bow and quarter sections a moderate fullness, thereby gaining power and "sweetness", and instead of the present "belly" allowing a long "run", destroying thus the "Sectional" areas that create a great quarter-wave—a speed-killer. Thus we would get an abler driven boat. Second, modify limit on sail plan, and give more driving power. For example, my R sloop Aumaki, which holds two legs on the Corinthian cup, has often been out in heavy going —once with a 55-knot breeze. But we have never sailed a race under reefed canvas. So you may infer that the design should have a greater sail plan for average weather. Third, a sane application of the L.W.L. measurement. If "Load Water Line" means anything, it means wetted plane with "load" aboard, yet we are now allowed to be measured or weighed with racing crew aboard, and in the resultant computation for displacement our sail-plan suffers. Am I right?

New York. WM. K. HARCOURT.

* * *

Editor of THE RUDDER:

Have read with much interest the reprint of editorial which appeared in THE RUDDER of the August issue, and agree with the writer of the article that an ideal plant for yacht-building, based upon the same general principles of economy and efficiency that are recognized as essential in automobile and engine manufacturing, is a desirable thing for the future. However, it is the writer's opinion that the plant of the Gas Engine & Power Company, at Morris Heights, New York City, comes nearer to that than any other plant he knows of.

When it comes to large yachts, a one-designed class would not be practical, or perhaps desirable, for the reasons set forth in the article. Some people want speed at the sacrifice of beam and comfort, and some want beam and comfort at the sacrifice of speed.

The writer never was in sympathy with the idea of yachting in torpedo boats, because torpedo boats are too uncomfortable, and were never intended as yachts.

The article in question expresses the writer's opinion on most points mentioned.

New York. CHARLES A. SCHIEREN.

* * *

Editor of THE RUDDER:

I have read your editorial about the future of the sport of Yachting, and I fully agree with what you say. I am more interested in the department of power boating but the same conditions prevail, both as to boats and engines. I am sorry to say that the engine builders have not developed their products to anything like what could be done, or should be done.

Clayton, N. Y. CHESTER R. HOAG.

* * *

Editor of THE RUDDER:

I reply with some hesitation to your inquiry of Sept. 6th, as the article referred to seems to invite discussion of only powered boats and shipyards.

My conception of the ideal yacht is, propelled by sail only—a boat designed primarily to live in any sea, no matter what her size. Second to this, speed and accommodations suitable to the individual owner.

New York. W. S. RAOUL.

Chart Table

Editor of THE RUDDER:

In working a traverse sailing do you put the current down as a course and distance in the table, or do you work it separately, and then apply it to your resultant course and distance?

Long Island. W. W. BROWN

Either method can be used, but it is simpler to include it in the tables as a course and distance.

Course	Distance	N.	S.	E.	W.
S.E.	20	...	14.1	14.1	...
S.S.E.	25	...	23.1	9.6	...
S. by W.	40	...	39.2	...	7.8
W.S.W.	20	...	7.7	...	18.5
W. by S.	30	...	5.9	...	29.4
Current	...	...	...	...	...
N.E.	25	17.7	...	17.7	...
	...	17.7	90.0	41.4	55.7
	...	...	17.7	...	41.4
S. by E.	74	Approx.	72.3	...	1.43

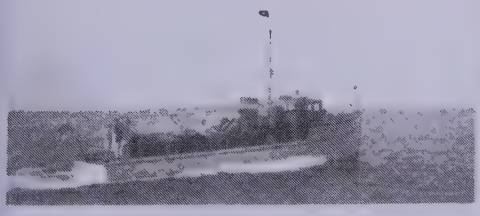
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Editor of THE RUDDER:

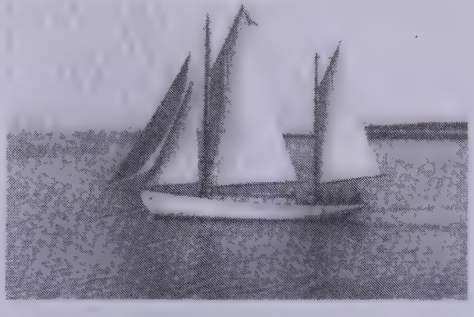
Suppose you heard one long blast, and one short blast in a fog, and then saw a red light on your starboard bow?

Vermont. A. J. JACKSON.

Whistle is that of towing vessel, red light on vessel towed. Starboard your helm and clear. Not safe to port as there may be another vessel astern in the tow.



Brenda II, Vice-Commodore C. Beresford Fox, Southern Y. C., Owner; 58 Ft. Long, Equipped With Two Van Blerck Engines of 300 H.P. Each; Speed 27 M.P.H.



Dr. Grenfell's 36-Foot Ketch, Lines of Which Are on Page 713

THE RUDDER

[Title Registered U. S. Pat. Office]

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President

Andrew Paterson, Vice-President and Business Manager

James R. Thomson, Treasurer

Arthur deZ. Patton, Secretary

Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

A National Naval Museum

Now that it has come, the great revival of American ship-building for which a few of us have watched eagerly and, if truth be told, hopelessly, for many years, is no more remarkable in its extent than in its nature. It is not alone that ways are being laid on every available bit of waterfront on the Atlantic, Gulf and Pacific coasts, the Lakes and the inland rivers, but in these days of steel and screw, when wood and sail are but remote and dying memories, a demand has come from all parts of the country for information concerning wooden ship-building. To all concerned with the making and selling of books there has come within the past six months inquiries which cannot be answered for works on the building of wooden vessels.

This emergency alone, apart from many other considerations, brings up the subject of the imperative need of a national museum of naval architecture in which may be gathered, before it is too late, an adequate record of the progress of the past; additions being made in accordance with the progress of the art. The little that has been done thus far is mainly the work of one man, the late Captain J. W. Collins, of the United States Fish Commission; an earnest worker, who had the forethought to appreciate the need of such a collection, and the ability to plan for its foundation. While in the Government service at Washington some twenty-five years ago Captain Collins was in charge of the nautical section of the National Museum, and though the conditions were unfavorable and much of his time was given to other duties, he accomplished a great deal. His starting point was the first effort of primitive man to traverse the waters, presumably by means of two bundles of reeds lashed together and used in the same manner as the "water-wings" of the twentieth century child. Next came the log which the man bestrode, propelled by some form of paddle, then the raft of several logs lashed together, the hollowed log canoe, and so on by many a slow step to the shaped and planked hull which gave for the first time an approximate degree of seaworthiness and speed.

Though greatly hampered by inadequate space and lack of funds, Captain Collins brought together a very interesting collection of models illustrating these initial steps in navigation and the development in particular of that American fishing fleet whose improvement was his life work. So far as we are aware, but little has been done since his death, the collection is still inadequately housed, many models displayed to very poor advantage, and nothing is being done to extend it either backward into the past or forward to include the developments of the future. Much the same conditions exist in the nautical section of the great museum in South Kensington, London, a collection rich in models of ships, both ancient and modern, and in marine machinery of various eras; here also room is lacking and also the supervision of an enthusiast and expert with funds for the extension of the collection.

There are good grounds for the hope that the revival of ship-building caused by the pernicious activities of the submarine will not prove a mere war expedient but a permanent awakening from a sleep of sixty years, and if so there is no time like the present for the establishment of a national museum of naval architecture. The plan itself should be far wider in scope than the present collection in the National Museum at Washington; the location should be in a seaboard city and a permanent building of sufficient size should be provided, with the assurance of funds for the maintenance and extension of the collection. Within the past twenty-five years much study and money have been expended upon the production of replicas of historic craft, the Columbus caravels, the Viking ship, Hendrick Hudson's Half Moon, and Fulton's Clermont. Though built as parts of temporary exhibitions, all of these craft were of such construction as to ensure long life under proper care. Unfortunately such has not been given them, and they are now in different parts of the country, rapidly going to pieces. If possible a basin should be provided for these valuable relics of the past.

The one obvious location for such an institution is the port of New York, and no better site could be found than the hills of Staten Island, looking down on the Upper Bay and the Narrows and commanding the sea approaches for miles, with a basin on the neighboring waterfront for the floating exhibit. A scheme of this kind was proposed by some of the public-spirited members of the New York Y. C. a few years ago, but nothing came of it.

Such a project is primarily one for the national government, but it should command the support of the shipbuilding and shipowning interests, of yachtsmen and all interested in both the future and the past of American shipping. Though the entire energies of the nation are just now concentrated on the war, now is the time for the formulation of plans for such an institution, to be put into effect as soon as possible after the establishment of peace and while the interest of the American people is centered as it has never been before upon American shipping.

America

Shortly after the first race in defense of the trophy to which she has given her name, when she finished fourth out of a fleet of eighteen starters in August, 1870, the schooner America was put up at Marshal's sale in Baltimore by the Navy Department and bought for $5,000 by General Benjamin F. Butler. Though ac-

tually a prize of war, she had never been condemned legally by a prize court, and as the Government had established no legal title it was decided to sell her. She fell into good hands, in that General Butler had the highest possible sentimental regard for the old boat, but unfortunately he had even a higher estimate of the invincibility of her model, in which he was confirmed by her skipper, "Jim" Read. After sailing her in several races against the schooners of the seventies he had her rebuilt and modernized by D. D. Kelly, of East Boston, and again, in 1885, she was taken in hand by Burgess, an outside keel of 25 tons of lead added, the counter lengthened, and material changes made in her rig. In spite of these improvements, which did much to destroy the identity of the vessel, she failed to hold the schooners of the day, notably Fortuna, and she was not raced after 1886. On the death of General Butler in 1892 the yacht passed to the ownership of his son, Paul Butler, and his daughter, Mrs. Blanche Butler Ames, mother of Congressman Butler Ames. Mr. Butler has been a member of the Boston Y. C. since 1877, and Mr. Ames joined the New York Y. C. in 1898, so the yacht has been for many years in the two clubs. She was last in commission in 1901, Mr. Ames sailing her on the New York Y. C. cruise.

For many years America has been tied up in one of the yacht berths of the Boston rivers, the Charles or the Mystic, her last berth being just above the Summer Street Bridge, between Boston and South Boston; early in September she was placed in the hands of a shipbroker for sale and advertisements were inserted in the yachting papers. As no one came forward to buy her for yachting use, her fate would in all probability have been, after the removal of her lead keel and the substitution of cheaper ballast, to carry Portuguese between the Cape Verde Islands and New Bedford as they come over each year to work in the cranberry bogs of Cape Cod. Fortunately for American sentiment, the yachtsmen of Boston took speedy action through Mr. C. H. W. Foster, who, with several associates of the Eastern Y. C., came forward and purchased the yacht through the Hollis Burgess Yacht Agency. The America will probably be changed to her original schooner rig with raking masts, and will be preserved as a yacht as long as she lasts and be used for a museum.

Yacht News As She Is Wrote

In the days when yachting was largely a matter of local interest, confined to New York, Boston and a few other waterside cities, the sport was considered as worthy of serious and careful treatment by the daily press. All of the leading dailies of these cities numbered as permanent members of the staff expert yachting writers, men who were known to and esteemed by the yachting public. Today, when yachting has spread from the Atlantic Coast to the Pacific, from the Lakes to the Gulf, when every little inland stream boasts its fleet of power yachts or launches, and when from a mere sport it has become a national institution, it is practically ignored by the daily papers. The regular doings of the yachting fraternity are neglected; the races, even the most important, are reported in a slovenly and lubberly manner; and, when some unusual event demands a notice, familiar facts of history are slaughtered in a way that is discreditable to 20th century journalism. An instance of this was shown, about a year ago, on the death of General Paine, one of the most prominent personages of modern yachting, who was described in the daily press as "the sailing master of the Puritan". In the same way the revival of public interest in the yacht America has brought out the stock collection of myths which have long clouded the history of this famous craft: her winning of "the Queen's Cup", the touching tale of the Queen and the Quartermaster—"Your Majesty, there ain't no second," and other equally fictitious incidents of her career; the credit for her design and construction, which rightfully belongs to George Steers, being given to another.

It is not too much to claim for yachting today a preeminence over all other American sports; if it was not recognized before, the present war will force home the realization of the fact that a large pleasure navy and a widespread and deeply-rooted love of yachting are the most valuable of assets for a nation which must uphold its supremacy on the sea, both in war and commerce, and that at the same time has an enormous inland population all of whose interests are foreign to the water. It was a mere accident, but a most fortunate one, that just at the time when it was desirable that the entire country should be awakened to the rebuilding of the American Navy, begun by Secretary Whitney in the early eighties, there came three successive victories of American yachts in great international contests; the full details of each match being spread throughout the country through the good work of the daily press. To a generation that looked to the railroad as the one medium of travel and commerce, that had never seen the sea, and that knew of a ship only as something associated with the disreputable word "subsidy", there was brought home a realization of challenge and combat from without; peaceful and friendly, it is true, but indicative of hostile possibilities.

Never before has the yachtsman been so well served with technical literature as at the present time; both periodicals and books are numerous and of high character, but no monthly magazine can give space to that current yachting news which is such a factor in the popularization of the sport. It is not enough that the yachtsman shall know where to find what he wants in magazines or books; but the current news of the sport should be disseminated in such attractive form as to interest the casual reader and bring new recruits to yachting. This task rests with the daily papers; they did it years ago, and did it well; why have they abandoned it?

The Late Charles H. Tweed

It is a singular fact that two of the most noted yachts of their day, Clara and Minerva, were owned by men who were members of the leading yacht clubs interested in the sport, but at the same time comparatively unknown outside a small circle of personal friends. Early in 1885 Mr. Charles Sweet, a London barrister and a member of the Royal Thames and the Royal Clyde clubs, came to New York on legal business connected with the Northern Pacific R.R., in which he was associated with Mr. Charles H. Tweed, of New York and Beverly, Mass. Together they purchased the Fife cutter Clara, then in her second season, and engaged Captain John Barr to sail her. She came out in August of that year, in the hands of one of the skippers who made a business of taking yachts "foreign", but Charlie Barr was one of her crew.

Clara's unbroken record in the 53-foot class is a matter of history, but Mr. Tweed took little pleasure in racing, and in 1886 imported the Watson 5-tonner Shona, keeping her at Marblehead for his own sailing. Charlie Barr was promoted from the forecastle of Clara and made skipper of Shona, with young John Barr, his nephew, as sole "crew". In spite of her owner's disinclination for racing Shona managed to make a name for herself by one clean victory over the almost invincible Shadow.

In 1888 Mr. Tweed ordered from Will Fife, Jr., a cruiser of 40 feet l.w.l., "with a good cabin". The yacht was built at Fairlie and christened Minerva, after Mrs. Tweed, who was Miss Minerva Evarts, daughter of William M. Evarts. Captain Charles Barr sailed Minerva across and she took up her moorings in Marblehead Harbor; the 40-foot class was not in existence and there is no evidence that Mr. Tweed intended to race her. As the result of some chance racing of yachts of under 40 feet l.w.l. in that year the class took definite shape, and during the following Winter a number of yachts were built for it. In 1889 Mr. Tweed was elected Admiral of the Corinthian Y. C. of New York, and as a compliment to the club Minerva was sent to the club station at Tompkinsville, Staten Island, in the Spring. She was not entered for any of the regattas, though the new 40-foot class was the great feature of the season; making its formal debut in the New York Y. C. regatta of June 13th. Before she reached the S. W. Spit, Liris, one of the notable boats of the class, was dismasted, to the intense disappointment and disgust of her Corinthian crew, as there was no possibility of repairing the damage in time for the other regattas closely following. On the way home in tow Mr. E. M. Padelford suggested that Admiral Tweed had a new 40-footer and that he would probably be willing to lend her for the Seawanhaka-Corinthian Y. C. regatta on the 15th. The result was that Minerva was turned over to the Liris crew, with Mr. John F. Lovejoy as helmsman, and, though giving time to much more powerful boats, won easily. This ended her career as a family cruiser and she finished the season with a recognized position as the leading boat of the new class. Early in the following year she was sold to Mr. John Lee Carroll, reaping new victories under the skilful handling of Captain Barr. In 1909 Mr. Tweed added Volante, a 45-foot launch, to his fleet, Shona being kept until 1912 when, with a number of other imported yachts, she was broken up to avoid the heavy tax imposed on yachts of foreign build. Captain John Barr was retained in Mr. Tweed's employ, caring for the family fleet, up to the time of his death.

Mr. Tweed died at his New York home on October 11th, in his seventy-fourth year. He was born at Calais, Me., graduated from Harvard, and was admitted to the bar in 1868, entering the office of Evarts, Southmayd & Choate in the same year and becoming a member of the firm in 1874. He was connected with many railroads and for a time was a member of the banking house of Speyer & Co. His yacht clubs were the Corinthian of New York, Seawanhaka-Corinthian, Beverly and Eastern. Though his racing honors were largely forced upon him, he was a good yachtsman and a lover of the water.

* * *

The supplement this month is the steam yacht Cristina, now in the Government service somewhere. Cristina was built in 1912 for Frederick C. Fletcher, of Boston, from designs by Gielow & Orr. She is one of the most perfectly appointed yachts afloat, or rather she was until she was turned over to the U. S. Navy by John L. Severance, of New York, who not long ago purchased the yacht and named it Artemis.

Spokes from the Rudder Wheel

The annual meeting of the American Power Boat Association will be held at the Waldorf-Astoria, on Tuesday, October 30th, at 2:30 p. m. The session will continue through the afternoon and evening. Some amendments to the racing rules, suggested by the Council, will be submitted to the delegates. One of these is to eliminate the nautical mile in measuring the courses for the Gold Cup and substitute the statute mile. Measures to improve racing in restricted classes will be discussed. Officers are to be elected for the coming year.

* * *

The usual speed fiend has been in evidence this season, running as usual full tilt through fleets of yachts at anchor. In the Lower Harbor at New Rochelle these wild dashes have made yachting dangerous to women and children, so serious, in fact, that Commodore Coe, of the Power Squadron, has appealed to the Federal authorities, offering the services of the Squadron to put a stop to this nuisance. It is hoped that Commodore Coe's offer will be accepted, as work of this kind can be carried out by the Power Squadron in every section of the country. No other organization is so well prepared to render the far-reaching service of the Power Squadron through its country-wide organization.

* * *

B. P. Miller, who has contributed occasionally to THE RUDDER and will be remembered chiefly by having written "A Trip Down the Rogue River," is now a lieutenant attached to the Adjutant-General's staff at Washington.

* * *

Nine power yachts took part in the race of the Tamaqua Y. C. recently for a cup donated by A. W. Middleton. The course, 50 miles in length, took the yachts from the Bell Buoy off Manhattan Beach to Jones Inlet and Ambrose Channel and Scotland Lightships. The race was won by A. W. Middleton's Grace Irene by 5 seconds, corrected time; R. A. Snyder's Keewaydin was second and Commodore H. E. Childs's Blue Bird third. Kodak, owned by R. T. Haslinger, lost her rudder and was steered home with a floor board attached to a broom handle. The yachts raced in a gale of wind and heavy sea.

* * *

Cyrus H. K. Curtis, of Philadelphia, whose steam yacht Lyndonia has been taken by the Government, has placed an order with the Gas Engine & Power Company for a new yacht over 200 feet long, to be built as soon as the war ends.

* * *

Orders for yachts, to be built when the war ends, are piling up so fast that the indications are that every inch of space in the builders' yards will be occupied with new work for a long time to come. Big times are ahead for all and everyone should be an optimist.

SIGNING AND BUILDING NUMBE

THE RUDDER

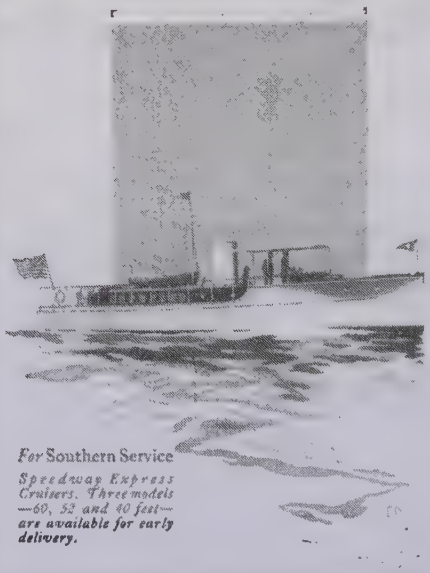
DECEMBER, 1917

Vol. XXXIII No. 12



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Supplement to The Rudder

THE PRESIDENT'S YACHT MAYFLOWER, WITH A U. S. BATTLESHIP PASSING OUT

The New York Skyscrapers of the Downtown District Are in the Background. Mayflower Was Built From Designs by G. L. Watson For the Late Ogden Goelet and Was Purchased by the U. S. Government at the Time of the Spanish War

A Magazine for Yachtsmen

THE RUDDER

Edited by Arthur F. Aldridge

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Volume XXXIII December, 1917 No. 12

The British Trawler and Its War Services

THE hardy fishermen of Great Britain have played a part in the present war which is more important than can be appreciated unless one has seen their work. With their steam trawlers, from the time of the outbreak of the war in August, 1914, they have patrolled the coast of their country, guarded the harbors from the vessels of the enemy, planted mines in the sections where commerce is restricted, swept the waters for mines laid by the enemy, and done hundreds of things that none will ever hear of.

They have not only worked for their own country but they have protected the French coasts and have even been sent to the Mediterranean. Only recently when an American mine sweeper foundered in a gale off the French Coast, the crew, about eighty men, were rescued by a British trawler and the Americans who were picked out of the water were made as comfortable as possible under the conditions. They had lost everything.

A gale was blowing at the time and there was the usual rough sea so common to the Bay of Biscay and the trawler, true to all her traditions, rolled and bobbed about like a cork. All the Americans, according to a report received from one, were seasick, although they had only a short time before finished a rough passage



The British Trawlers Have Done Fine Work in Protecting the Coasts Sweeping For Mines. Manned by Hardy Fishermen, These Wonderfully Seaworthy Craft Are in a Class by Themselves. The Photograph Shows Them on Patrol

across the Atlantic. The British seamen were somewhat surprised at this, thinking the conditions only average, and one remarked, "Why, we fish in such weather as this." The vessel was rolling her rails under with every sweep.

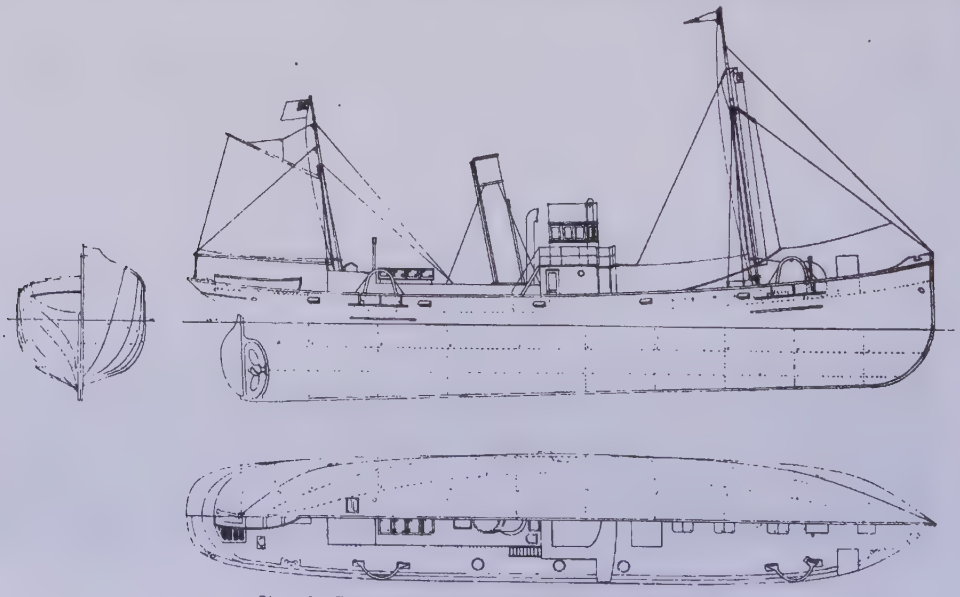
These trawlers go out in the North Sea, where there is a short chop and where the storms are very severe in all weathers, Summer and Winter. The Winter nights, too, in that sea are long and the weather is cold and bleak, but the fish they catch furnish a very large part of the food of the British Islanders and these fishermen have to supply the market.

The trawler is a model peculiar to this locality. The boats are from 80 to 150 feet in length, built of iron or steel, and driven by compound engines. They have rounded bilges and naturally have little initial stability. It is intended that this should be, for they roll and wallow in the seas when hove to and ride the waves easily when driving ahead.

The English are very fond of what are termed bottom fish, sole, plaice, flounders, etc., and to catch these fish the men trawl. They use a flattened net which is towed along the bottom of the water. The North Sea, where they operate mostly, is comparatively shoal. This net, which has been likened in shape to the old-fashioned carpet-bag, is about 10 feet wide. It is made of steel mesh generally and to this the trawl line is attached, and the net, dragged along the bottom, scoops in the fish as the trawler pulls it along. Hull and Grimsby are the headquarters of the trawlers, but the boats, instead of following the custom of the Gloucester fishermen of making a good catch and then hurrying to market, transfer the fish to another vessel which transports it to market while the trawler continues its work.

One of these vessels usually has a crew of perhaps twenty men, that is, a vessel of 150 feet, and the fishermen are paid $60 a month. Little enough pay for the work they are doing now in protecting their country. Instead of trawling for fish they now trawl for mines. The steel net, which sinks below the surface of the water several feet, is fastened to the odd-shaped gallows which are shown in the line drawing of a trawler. One vessel has one end of this net attached to the after gallows and another has the other end, and in this way they drag through the water at about 7 or 8 miles an hour, catching mines. Sometimes several of these trawlers will proceed in what Navy men would call line-abreast formation with the end of a steel net fastened to each side of each vessel, except those at the two ends of this line, and in this way they will sweep a large expanse of water. Sometimes the mines will be lifted on the decks, sometimes they are destroyed, and sometimes they will explode and blow the vessel to pieces causing the loss of many of the crew. An American passenger steamer, coming from Liverpool before this country was in the war, passed a line of trawlers mine-sweeping that extended as far as those on the steamship could see. They were sweeping the Irish Sea. At times when a German mine-layer or submarine has scattered mines indiscriminately about the British or French coasts, all navigation is stopped until the trawlers have swept the dangerous waters and again made them safe for commerce.

At the outbreak of the war there were about four thousand of these vessels owned in Great Britain. They were put into service at once. Many have been lost. Many of the fishermen have been drowned. Others have been captured by the Germans and are now held as prisoners. New vessels have been built to take the place of those lost and other men have undertaken the hazardous work of mine-sweeping and mine-laying. They are a daring, fearless lot of men, giving their lives uncomplainingly to their country, and doing wonderful work.



Lines of a Typical English Iron Steam Trawler by G. B. Douglas

Albert Strange, Yachtsman, Artist, Musician

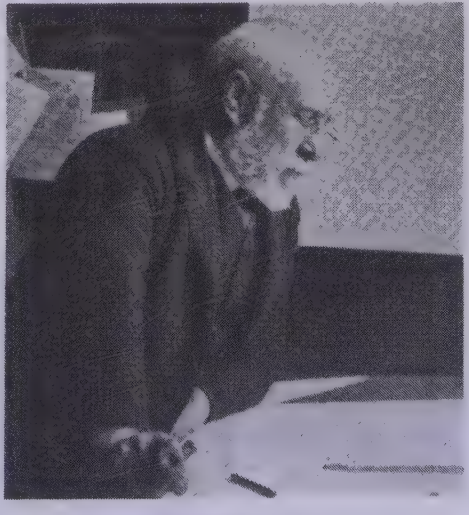
By W. P. Stephens

MY first acquaintance with Albert Strange—who died July 11, 1917—came about many years ago by chance, each knowing of the other as a canoeist who was also interested in small yachts. A correspondence that was at first limited to these two subjects in time disclosed a similarity of tastes; a deep interest in design and construction, a love for music, and perhaps a rather pessimistic view of the politicians and partisans of our respective countries. Our direct personal intercourse was limited to a brief three days in Scarborough, in 1913, wandering about the hills and harbor of that quaint old town, and inspecting in particular the cobles for which that part of the coast is noted and the many odd craft that frequent the port. In our many years of regular correspondence I came to know him intimately and to esteem him not only for many sterling qualities as a man, but as a devoted yachtsman and a disinterested worker for the good of the sport. His work as a designer appealed to me as based upon actual experience at sea and a broad and comprehensive view of the whole subject of design; while recognizing the value of racing as an essential part of yachting, and giving much time to the study of measurement, he had no use for the racing machine, the freak or the rule-cheater.

The conventional small British cruiser has always been more or less of a tub; however safe and even comfortable she might be, many essentials were sacrificed to internal accommodation, and, with deep heavy bilges, excessive displacement, wide rounded keel and great weight of construction, she lacked much in the way of reasonable cruising speed and in weatherliness. The cruisers designed by Mr. Strange, some one hundred and fifty in all, were notable for their refinement of form, giving speed, handiness and weatherliness, for the amount of internal accommodation, and its excellent arrangements; while his construction, though thorough in every way, lacked the excessive weight of the conventional small cruiser, with a proportionate gain in speed. While unrestricted racing and speed records had little attraction for him, he held a wholesome belief in the value of refinement of form and reasonable speed as elements of safety in a cruising yacht.

Mr. Strange was born on the Thames, in 1855, and his boyhood was spent about the lower river. An inborn fondness for boats led to an acquaintance with the local sailormen and boatbuilders which laid the foundation for that practical knowledge of boats and boat handling which is evident in all of his craft. As he told me the story, one of his early experiences, as a boy of fourteen, was when a boy choir of which he was a member was taken for a day's excursion on the river. The boat was a local fishing or party boat, handled by her owner; Mr. Strange, with a model yacht which he proposed to sail during the day, managed to get aft and in time to be permitted to hold the tiller. At the end of the trip the boatman said to him, "My boy, if your parents are willing, you may come out with me at any time when you are free from school"; a privilege which was utilized to the utmost. It so happened that the boatman was employed as a pilot in the Spring matches on the Thames, sailing on such historic craft as Egeria, Pantomime, Sea Belle, Rose of Devon, Arrow, Fiona, Aline and Kriemhilda; when the time came his amateur apprentice was taken along as "boy", helping to serve the bread and beer and enjoying to the full the racing of these famous yachts.

At the age of seventeen he was cruising about the Thames and the Medway in a small boat, the Stella, and studying the Thames barges, the bawley boats and the many other interesting local types that abound on English rivers. Destined by his father to the law, he rebelled against such a prosaic fate, and for a time made a serious study of music, but later decided on painting, studying first in England and later in France, spending some time on the coasts of Normandy and Picardy, of course largely afloat. On his marriage, in 1882, he settled in Scarborough as the head of the Government Art School, having under him some two hundred and fifty pupils, students of art and in particular its application to textile, wall paper and pottery designing and book illustrations; teaching naval architecture to those who were interested. His personal work was largely marine and landscape painting; but though busily occupied in teaching and his private painting, time was always found for



Albert Strange—At Work



Cherub III on a Cruise

the study of boats; not merely yachts but fishing and other working craft. For this no better place could be found than Scarborough, a port visited by "mysterious luggers from the far North of Scotland, Dutch busses and pinks, French ketches, Penzance luggers and Manx nickies".

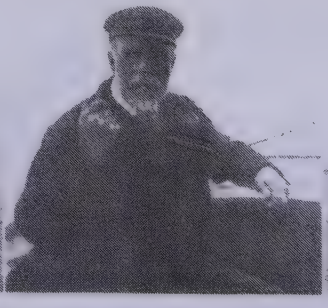
Recognized in time as a skilful sailor and a reliable pilot for the North Sea, the Channel, the Irish Sea and Scotch waters, as well as Holland and German waters, Mr. Strange was welcomed aboard many yachts, but he was always open to the appeal of single-hand work. After the usual course of evolution in small open boats and canoes, he designed for himself a small cutter, Cherub, 21 by 7 feet, building her at Scarborough in 1888 and cruising from that exposed and open port out on the North Sea. In 1893 Cherub was replaced by a still smaller boat of the same name, a canoe-yawl 20 feet over all, with a small iron keel and a steel center-plate; half-decked but with a flat hatch, hinged at the fore end and lifting to make a cabin at night. After a cruise on the Zuyder Zee in 1893, a much longer and more dangerous cruise was made in the following year, from Scarborough to London, most of the way on the North Sea. The first half of the cruise, which lasted six weeks, was in bad weather, much rain and strong winds; in seeking refuge in Blakeney, a little tidal port on the Lincolnshire coast, Cherub II was caught under three reefs at low water in the narrow passages between the sands and, unable either to anchor or to beat off, was obliged to run the bar at dead low water, before the wind. Though she struck several times, her draught aft kept her from broaching to and she came through in safety. In the following year, after the Meet of the British Canoe Association at Wooton, Isle of Wight, Cherub II made the cruise up Channel, some 200 miles, to the Thames, again single-handed. About this time Mr. Strange began to design small cruisers, canoe-yawls and canoe-yachts, for his friends of the British Canoe Association and the Humber Yawl Club; the demand growing as his craft became better known, until of late years this work occupied much of his time. His Summers were given up to painting, either inland or afloat; most of his cruising being in company with an artist friend for whom he designed the auxiliary ketch Quest II, a cruiser of which he was justly proud, their sailing waters being the Irish Sea and the West coast of Scotland.

The writer's predilection for the canoe type as the ablest of all cruising craft led, about twenty years ago, to an attempt to adapt the general form of the whale-boat to a yacht with an overhanging counter; the result being what is now very common in both sail and power yachts, though then practically unknown, the misnamed "canoe" or, still worse, "compromise" stern. On discussing this new development with Mr. Strange, I found that he had anticipated me by several years, having designed several canoe-yachts with the same pointed counter. What he was generous enough to call "our" stern has always been a favorite with him; Mist, whose lines are here given, being but one of his many double-ended yachts. Everyone familiar with the performance in broken water of a yacht with a wide flat counter, short or long, must appreciate the perfect balancing of the two ends through this easy and shapely stern.

In 1910, after contributing to the pleasure of many fellow-cruisers, Mr. Strange realized his own chosen



Tern III, L.W.L. 43 Ft. 6 In., Designed For Claud Worth, Esq.



Albert Strange—At Play

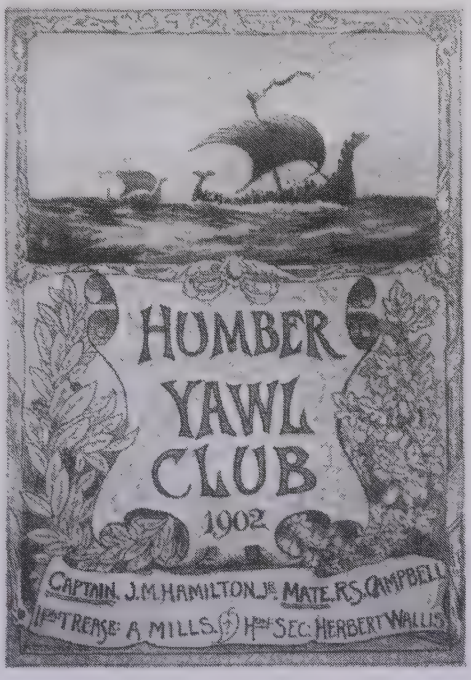


Hawkmoth, Canoe-Yacht, Designed by Albert Strange

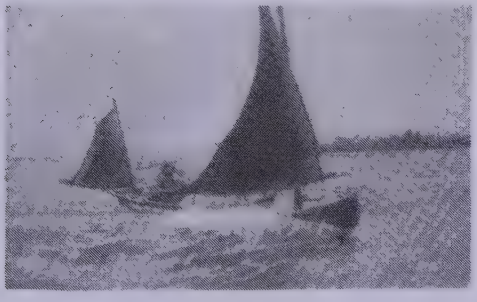
ideal in Cherub III, a model single-hander similar in general form to Mist. She was 26 feet over all, 22 feet 9 inches water-line, 8 feet 4 inches in breadth and 3 feet 9 inches in draught; with 483 square feet of sail in her yawl rig, and an iron keel of 3,540 lb. The internal arrangement was remarkable,—a cabin with 5 feet 6 inches headroom and a wide hammock cot on each side over the sofa, a stateroom with bed-berth on starboard side forward, with a hammock cot in the forecastle. The little galley was abaft the cabin, directly under the companion hatch, and every cubic inch of space from apron to horntimber was utilized for shelves, lockers and pantries. The yacht was built at Tarbert, on Loch Fyne, Scotland, a favorite cruising ground, but the anticipation of a Summer afloat in these beautiful waters was not realized, owing to the serious illness of Mrs. Strange after their arrival. The next season was more successful, Cherub III being handled by the family, including the two sons as crew. The death of a brother, Canon Strange, British chaplain at Port Said, began a series of misfortunes. Mr. Strange had suffered from a weak heart, and a bad attack of grip in November, 1911, made the trouble very serious, his doctor prohibiting all sailing for the future; in the following year an only daughter died of consumption and an intimate friend, for whom he designed the yawl Hawkmoth, was accidentally drowned. Writing in April, 1914, he said, "I went to see my doctor the other day and he found that my wretched heart was rather better; I promptly put it to him: 'Was it enough better for another boat?' but he demurred. However, I got out the lines of a little chap, 21 by 7.6 by 2.9 feet, and am going to ask Dickie, of Tarbert, for a price; then, when you come over next year, you can come for a cruise about Loch Fyne."

The war brought new trouble, his patriotic interest in the national aspect of the great struggle dominating the personal side; though his business interests suffered as in the case of so many of his countrymen. In the shelling of Scarborough in 1915, the town at that time having about the same military and naval importance as Atlantic City and Asbury Park in this country, his house was hit by a shell, fired by a German cruiser over the great promontory to the North into the center of the town. One of a row of heavily built stone houses, and the shell striking the party wall, no very serious damage resulted, though Mr. and Mrs. Strange were close to the point of impact; there is waiting for me in Scarborough a fragment of a German 5-inch shell as a souvenir.

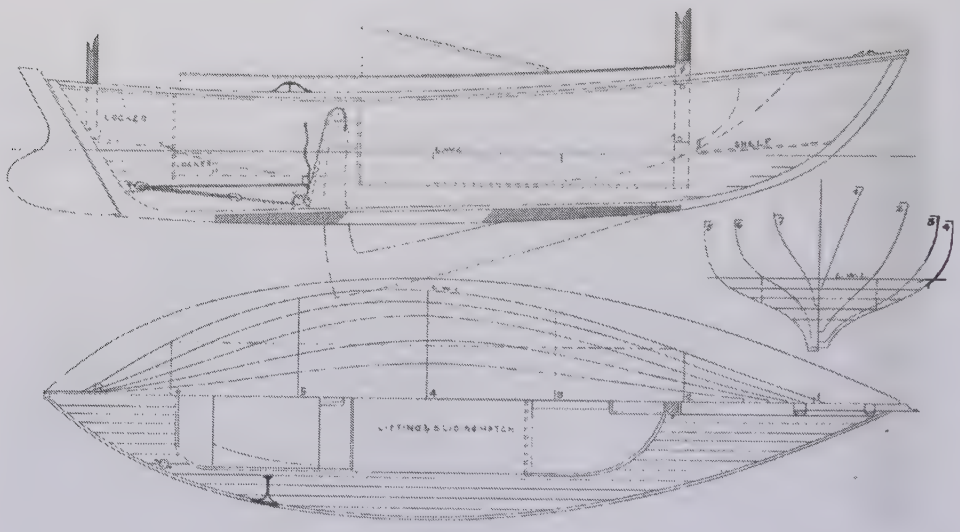
In spite of steadily declining health and the other demands on his time, Mr. Strange kept up his work for yachting; long a member of the Humber Yawl Club, he contributed every year the cover for the annual book and one or more designs of small craft. Within the past few years he was called on for designs of larger yachts, up to 75 feet length; though none of these are available for publication just now, they show the same characteristics as the smaller craft—reasonable proportions and refined form. The new Tern III, for Mr. Claud Worth, so widely known through his book "Yacht Cruising", was designed by him. In 1915 he contributed a valuable series of articles on design and construction to *The Yachting Monthly*, and though racing was always of secondary interest he gave much time of late to the discussion of a revision of the rules. Some of his last work in print was a plan for what has been called the "Nursery Class", of small one-design seagoing cruisers to be built at a minimum of cost to meet the demands of young Corinthians after the war; his two trial designs meeting with generally favorable comment. For the past year, thanks to the pernicious activity of the U-boats, our correspondence has been broken and irregular, but as late as June he reported an improvement in his health and was much interested in several new designs for large yachts on which he was engaged. With the exceptionally fine weather which marked the early Summer in England his doctor pronounced him so much better that his sudden death on July 11th came as a surprise even to those who had long realized that such an end was inevitable.



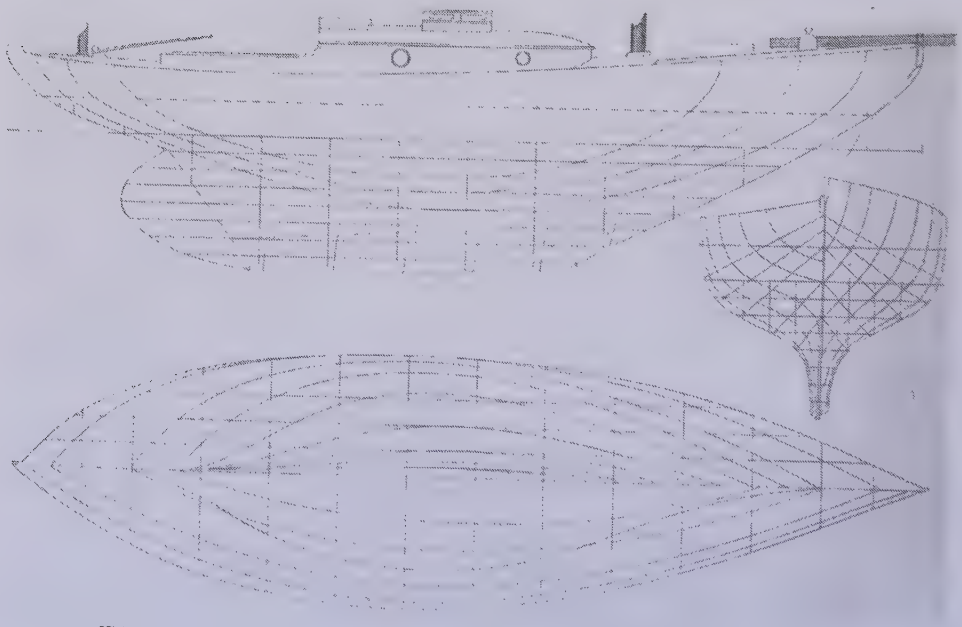
Cover of Humber Yawl Club Book—One of Many Designed by Mr. Strange



Cherub II in the North Sea



Cherub II, 20 Ft. O. A., 6 Ft. 3 In. Breadth



Mist, Canoe-Yacht, L.O.A. 26 Ft. 6 In., L.W.L. 20 Ft., Breadth 7 Ft. 1 In., Draught 4 Ft. Sail Area 654 Sq. Ft.

Mr. Strange was by no means the aged and venerable man which his portraits indicate; barely sixty-two at the time of his death, his premature baldness and gray beard many years since made him appear much older than he really was in either years or disposition. Strong as was his love for the sea, it was second to his patriotic devotion to all that was oldest and best in English life; there is a suggestion of that other sturdy Englishman, George Borrow, in the following, from a comparatively recent letter: "One of my boy chums has just died at Grimsby; his father used to take him on Pantomime, a rival schooner to Egeria and Sea Belle, and we sometimes as boys came to fisticuffs as to the merits of the boats *he* sailed on and *I* sailed on. In those days boys at school were ever ready to settle little differences by a fight, being good friends afterwards. Nowadays little boys are regular snivellers, and a good fight is rarely gone in for; but I think that the modern boy—and I have had a pretty good experience with him—is in no way better for this." A friend writes: "You knew Strange as a charming personality and an exceptionally clever designer, but I think that you have never quite realized what a really great artist he was. His place should have been in the very front rank, and I could never understand how it was that he was not much better known as a great artist."

A. P. B. A. Annual Meeting

THE annual meeting of the American Power Boat Association was held at the Waldorf-Astoria Hotel, New York, on Tuesday, October 30th. The session began, as usual, at 2:30 o'clock and lasted through the evening, with a short intermission for dinner, at which the delegates were the guests of President Albert L. Judson.

All the officers except one were re-elected. Those who have been continued in office are: President, Albert L. Judson; secretary, Charles P. Tower; treasurer, George C. Krusen; measurer, Frederick W. Lord, and surveyor, F. W. Horenburger. Harry Sampson, Jr., was elected timer to succeed Reuben B. Clark.

The treasurer reported that the Association had a substantial balance in the bank and no outstanding obligations. The secretary reported that a year ago there were one hundred and forty-one clubs enrolled in the Association; seven of these have been dropped and eight new ones added, so that the total enrollment is now one hundred and forty-one. One new section, that of Gravesend Bay, has been added. Twenty-two clubs were represented by delegates at the meeting and twenty-eight by proxies.

Following the example of THE RUDDER in publishing an Honor Roll of the club members who are now in some branch of the service for their country, the secretary was directed to ask each club in the Association to furnish a list of its members who have qualified for this roll.

An amendment was passed, giving the racing commission power to withhold sanctions in the cases of races held in conjunction with sporting or other events and where there were gate receipts or other serious restrictions that approached a monopoly that might be considered to interfere with the purely amateur spirit of a power-boat contest. It was also decided to measure all courses except offshore or regular cruiser races by statute instead of nautical miles. The Deeds of Gift of the various trophies and the time allowance tables will be changed to conform to this new rule.

An amendment to fix the minimum radius at the turns in high-speed boat contests caused considerable discussion. G. A. Wood, owner of the Miss Detroit, contended that it was as much the function of a speed boat to be able to make hairpin turns as to show speed on the straightaways, and told how James Simpson had timed the Miss Detroit as making 63 miles an hour around the sharpest turn of the Thousand Islands course, which statement brought forth amusing comments from many of the speed-boat enthusiasts present. Mr. Chapman recommended that the turns at the so-called ends or intermediates be not greater than 70° and that the distance between buoys be not less than 600 feet.

It was decided that the matter be referred to the Racing Commission, with authority to act. It was decided that performance handicaps be determined by trials over official A. P. B. A. one-mile courses hereafter instead of those of varying lengths.

The rule which has to do with the ownership or chartered possession of a power boat entered in a race was changed so that the charter must have been in existence for at least thirty days prior to the contest. This was the result of one competition held this year in which the boat had just been turned over to the man who raced it, and when the old thirty-day clause was called to his attention he said the day of the race was the first of the thirty-day charter.

A. P. B. A. certificates to winners of sanctioned races during the year were distributed as follows: To G. A. Wood, Miss Detroit, for the Gold Cup and one-mile championships; C. B. Seeley, Middletown Y. C., the Alarm, free-for-all for express cruisers; Frank Maron, Middletown Y. C., the Valiant, performance-handicap race; Bell and Campbell, Camden Y. C., The Pickaninny, Delaware River cruiser championship; Commodore Harry Anderson, the Gardenia, A. P. B. A. championship cruisers, Long Island Sound; Henry A. Jackson's Victory II, L. I. S. P. B. A., cruiser championship, and A. L. Judson's Hawkeye, Lake George speed championship, as well as J. J. Harty's Rat, Kingston Y. C. displacement races at the Thousand Islands Y. C. course.

The Toronto M. B. C., latest addition to the A. P. B. A. forces, was represented by Thomas W. Rae, who, in behalf of the club, offered another speed-boat championship trophy, the Deed of Gift for which will closely resemble that of the Thousand Islands Club trophy.

Mr. Judson, after being re-elected, said the Association had grown stronger in personnel, rather than numerically during the last year, and that several applications of clubs for membership had been rejected not for proud reasons, but because of a desire to avoid making enemies, and he believed the Association had grown immensely in the estimation of power-boat owners generally as well as the public.

In the War Zone

By a Junior Officer

"I AM just dying to see one of those U-boats. What a shame it would be to come over and not see one; I am going to help carry shells."

What has become of all those enthusiastic passengers who for the first few days at sea were so eagerly anticipating an encounter with a submarine? "One—no, let us meet two or three. We're out for excitement," they used to say.

We had been in the war zone about twelve hours, and although we had seen or heard nothing of the subs, our former enthusiasts seemed to be concealing their disappointment nobly.

On the bridge the Junior is pacing back and forth, one eye on the wheelhouse clock, watching the time for altering the zigzag courses, the other keeping a lookout ahead. The Commander, Lieutenant, Senior Watch Officer and several Petty Officers are scattered across the bridge, scanning every inch of the sea for a tell-tale ripple or flash in the sunlight. In the upper nest, eighty feet above the deck, the lookout's cap can just be seen over the top of the basket. An Officer keeps a lookout in the lower nest, and posted about the ship at many places from bow to stern are other lookouts. Some of the passengers had offered to assist in keeping watch and these had been put in the lifeboats. They took their duties seriously and kept a very good watch, but there manner of reporting often furnished amusement to the bridge..

"Something alive in the water," proved to be a friendly porpoise close aboard.

"Periscope dead ahead!" was a stump floating upright right abeam. In his excitement the lookout forgot he was facing abeam.

Four bells—darken ship; and from the bridge to the 'tween decks the Petty Officer goes over the ship, seeing that all port screens are on, all unnecessary lights out, all doors closed and curtained, and that all smoking on deck is stopped. A little spark of light might be sufficient to betray this great dark bulk slipping through the night, and every possible means is used to prevent any light being shown.

Do not strike the bell until daylight, is the order, and a great silence seems to have fallen on the ship. Astern our wake—never a very long straight course—is alive with phosphorescence. "What's that?" bellows a voice from the crow's-nest. Heading straight for our starboard bow is a wake of phosphorescence of a small object traveling at a high speed. It is almost upon us and we wait with bated breaths for the bump. Suddenly it swerves and swings around parallel to our course and shoots ahead into the darkness.

"Humph! only a fish," grunts the Commander.

So on through the long night the ship races Eastward, perhaps now and then slipping by a great black hulk stealing through the night. Sometimes only the quick maneuvering with the helm or engines averts a collision, but our safety is in our good lookout. To men who for years have been sailing the seas with ship lit up like a ferryboat, it is a source of constant wonder that there are practically no collisions. Of course, on bright moonlight nights the problem is not so difficult; but we are too good a target in the moonlight and much prefer the risk of collision to the risk of a torpedo.

Now and then a cadet appears in the bridge with a message from the wireless. Some poor devil asking for help.

"S.O.S. from S.S. Bellville—being shelled by sub. steering North 10 knots from Lat. —, Long. —, 10:40 a. m. G.M.T." Wish him luck. If he can only hold out until the patrol boat gets there.

The next day we rig out sounding machines and make preparations for landfall.

"Be careful of those courses; Ireland is not over 500 miles long and we want to find it," growls the Com-



U. S. Destroyer Buffeting the Seas on the North Atlantic in Search of Submarines and Convoying Troop Ships

mander. He has been on the bridge now over forty hours and the strain is beginning to ruffle his usual good-nature.

"Yes, Sir," replies the Junior, smiling inwardly as he proceeds to pass on the grumble to the quartermaster, who takes it out of the cadet after the Junior has gone out on the bridge. There is no one for the cadet to growl at, so he grumbles away to himself at the injustice of it all.

On the deck, pacing nervously up and down, are scattered groups of passengers, some with lifebelts slung over their shoulders, some with them on; some attired in the patent live-saving suits, the heavy lead soles of which thump heavily on the deck. Huddled in the chairs with lifebelts at their sides, sometimes two or three heaped at the foot of their chairs, or even sleeping with them on, are those who are trying to sleep all through the zone to drown their fears.

In the smokeroom many are playing cards, but everywhere is a little pile of lifebelts. Some of the more timid or else more humorous wear their belts to dinner.

There is more or less joking about what they are going to do, and if all the wild threats were carried out any submarine that would dare to show herself near our ship would meet with a terrible end. But the jokes seem rather empty and the dry, nervous laugh they arouse betray the real feeling of the audiences.

We are now in sight of the coast and the tension relaxes; some of the passengers are quite at ease. As long as they can see terra-firma they are perfectly safe. Of course, the menace from subs is much less but we are on sounding where mines may be planted.

The last night the wind hauled to Northwest and during the frequent snow-squalls reached the force of a gale. But in the messroom the weather was forgotten by the jolly crowd around the table. We would be in port in the morning and the Officers were making plans for their recreation in port and joking about the subs. The Senior Officer at the head of the table was reading from an old newspaper an account of how the Germans were preparing a ruthless campaign against American ships. One of the Juniors, holding a glass of water in his hand, remarked:

"Well, they had better make a start."

The words were hardly out of his mouth when ——— and the room was full of flying dishes. The ship seemed to lift about ten feet; the dull thud of the explosion was followed by a crash of broken glass and crockery. Mirrors, dishes, ports, skylights all over the ship were shattered into a thousand pieces.

"They've done it!" said the Junior as he dove through the door after the Senior.

We started up the bridge ladder when the four blasts of the whistle gave the order to abandon ship. We could feel the ship settling by the head as we went along the boat deck to lower our boats away. Passengers and crew poured up from below in a very orderly manner, warmly clad, and nearly everyone carrying some little parcel of valuables that they wished to take with them.

As soon as a boat was loaded we lowered it



Life on a U. S. Destroyer Is by No Means a Lazy One. These Vessels Drive at High Speed Through Rough Seas Which Sweep Their Decks. To Help the Men Keep From Being Washed Overboard Life-Lines Are Rigged, and the Photograph Shows a Sailor Wearing His Life-Preserver Holding On

down part way and made fast, awaiting orders from the bridge. Down below the Chief Engineer and carpenters were examining holds to find out the extent of the damage. Meanwhile several boats had answered our wireless calls for assistance and were rushing to us. In about half an hour the first steamer appeared through the snow-squalls and we asked her to take off our passengers. In spite of the nasty sea that was running this was accomplished without an accident, and the boats returned to the ship and were hoisted out again. All this time we were steaming ahead dead slow. Two large holds forward were full of water, and though there was quite a little water in the forward stoke hold the pumps were able to keep it down to a few feet. After our boats were aboard we steamed ahead at half speed, while below the Chief and his crowd were shoring up the bulkhead which separated the stoke hold from the number four hold.

The ship remained on an even keel except for a slight list from time to time as she settled by the head to about six feet. She steered very badly, carrying considerable port helm, but we were able to steam at about four knots. After several hours we reached our dock and the next day went into drydock. On the port side just forward of the bridge, extending from below the water-line to the tank tops, was a hole about 30 feet square.

After we made fast the Chief Officer, who was on the bridge at the time, told his version of the bump: "A column of water rose up as high as the fore top and the topmast whipped back and forth until I thought it surely would come down." The man in the nest slid down one of the back stays which had not carried away and came to the bridge and reported.

"All is well that end's well," and a few weeks later we were out again stealing through the zone, occasionally recalling to mind some forgotten incident of our experience with T.N.T.

Chased, Fired On, Overhauled and Searched

By Frank G. Cauffman

'TWAS an ideal August day, a day to sprawl lazily on deck, to give one's self up to peaceful dreams, and indulgence in *dolce far niente*. Overhead small whiffs of creamy clouds chased slowly across the blue, against which was silhouetted the high wooded shores of the harbor, with the little town snuggled at the farthest end, thrusting out a few finger-like wharves into the tranquil waters.

Nature was surely doing her bit to paint a lovely restful scene, but o'er its beauty fell the portentous shadow of Mars, for a glance beyond the harbor entrance disclosed, through the summer haze, the fighting tops of battleships mixed up with the smokestacks and masts of an attendant fleet, while between these and a wharf of the town there plied a continuous stream of navy launches, patrol boats and tenders coming and going. Usually at this season the harbor would have sheltered very many power and sailing pleasure craft, but here again was the effect of war visible, for now, with the exception of some small native boats and a couple of coasting schooners, could only be seen two or three power cruisers and a yawl lying at anchor.

On the deck of one of the cruisers sat its captain, lazily ensconced in an easy chair, engaged in writing to a friend. "This is the most uneventful cruise I ever made," he wrote; "three weeks and nothing doing out of the ordinary. Not one exciting incident has materialized, and I'm fast becoming dopey." Just then the nearby purr of a throttled exhaust made him look up and there bearing down directly toward him was a long, rakish scout patrol. Closer and closer it came, as if to ram him amidships.

"What the devil is that fellow trying to do?" he muttered to himself; but he wasn't long left in doubt, for when almost on top of him the officer at the wheel veered her head off a bit, and stepped to the rail.

"Ahoy there! Is this your home port?"

The cruiser captain scrambled to his feet.

"No," he shouted back.

"Well, then, you'll have to leave the harbor this morning, or be interned here indefinitely."

"Why, what for?"

"Never mind what for," came back the voice from the scout patrol; "those are my orders, so you'll have to go and the sooner the better. Make your course to ——— Ledge Light and keep away from the Long Island shore."

Now it's human nature to resent being peremptorily ordered to do something one doesn't want to do, and the cruiser captain was no exception to the rule. He had planned to lie several more days in this snug harbor, and here he was ordered to "git" and not to stand on the order of his "gitting" either; but as it was either "git" or fight the whole fleet, he decided it would be wiser to "git". In the meantime, the patrol boat backed off and dropped anchor not far distant as if to keep an eye on further proceedings.

After commandeering the mate,—who had previously gone ashore to see the sights—and replenishing the gas tank, the mud-hook was hauled and the boat headed for the harbor entrance. On getting outside, they found themselves right in the midst of a whole fleet of big and little fighting craft, the latter rushing 'round the former like wasps maneuvering about a nest. The prescribed course was held to, as much as possible, though it was no easy job dodging launches, scout patrols, and tenders darting hither and yon and giving but small heed to a mere civilian boat. It seemed a case of keeping out of the other fellow's way or standing a chance of being rammed.

"I won't be sorry," says the mate, "when we have cleared all this. I'm not nervous, but it seems as if

most of these Navy chaps are practicing seeing how near they can come without actually hitting us. Now just look at that fellow!" and he pointed to a big navy steam launch, full of white jackets, which was heading for them, bow on.

"Well," replied the captain, "we'll show them that at least we know the rules of the road, so port to port it is." And he threw the wheel over.

The launch apparently wouldn't have it that way, and slewed over to port. Still more the captain went to starboard and still more the launch went to port.

"If he wants us to come to, why the devil don't he give us a signal or a hail?" growled the mate, but not a sign or sound came from the launch, which was now getting almost across their bow. The cruiser captain muttered something under his breath which might have rendered him liable for sedition if heard in a Sunday-school.

"There's no use in keeping up this merry-go-round," he exclaimed, throwing off the clutch, while the launch made a long turn to evidently run alongside. Either the man at the wheel was short on seamanship, or else the launch was a clumsy one to handle for, instead of coming 'longside, it missed by ten feet or more. The men on the bow tried unsuccessfully to grapple with boat-hooks, while the cruiser captain accommodatingly held out a boat-hook to the officer, who was near the stern. He managed to grab it, but as the boats were drifting apart, it was a case of holding on and being dragged overboard or else letting go, and Mr. Officer discreetly decided on the latter. With that the launch sheered off and went ahead in an opposite direction as if disgusted with the whole business, and still without giving any sign of what was wanted.

The captain and mate looked wonderingly at each other. "Say, what do you know about that!" exclaimed the latter.

"Darn'd if I know," replied the captain. "Looks as if he didn't like our company. Well, I guess we can make that sentiment reciprocal," and he threw in the clutch.

For four or five minutes the boat shoved on peacefully, the captain and mate keeping a sharp lookout ahead and congratulating themselves that they were gradually clearing the fleet, and then suddenly something happened. From astern came the sharp roar of a gun and on quickly looking back, they were astonished to see the navy launch in full chase, while a wreath of smoke showed that her bow gun had just been brought into action.

"For the love of Moike!" cried the mate, excitedly. "Throw off that clutch; they evidently take us for the Kaiser and Von Tirpitz. Lord! It looks like irons and a dungeon cell for us."

It didn't take the captain long to obey this order, for on hearing the shot, several patrol boats in the vicinity quickly turned and made a drive to head them off, and the launch was coming up astern hand over hand, showing several men in the bow with rifles in their hands.

"Gee!" exclaimed the captain, "I guess we're in for some trouble all right; but what in hades do you suppose has caused them to jump on us in this way?"

The mate shook his head. "Heaven knows! Didn't like our looks evidently, or perhaps they caught a glimpse of the upward Teutonic twist of that mustache of yours, and say, drop that haughty Von Hindenburg expression. You look as if you were just in from Berlin."

"And you look as if you had just landed from Cork," retorted the captain.

"Well, most of the Irish are pro-Ally, so I ought to pass; but look sharp, here comes the Admiral. You do the parleying, and for the Lord's sake, be nice and polite. Tell him you are related to General Joffre, and that I'm a particular friend of Lloyd George, and ———— "

"Shut up," broke in the captain under his breath, "he'll hear you."

The launch, making a better go of it this time, was now alongside, and the officer climbed aboard the cruiser. He was a pleasant-faced young fellow, evidently a recent naval reserveman, and consequently somewhat new at the war game. The captain, putting on his blandest manner, stepped forward.

"Sorry, but I didn't know you wanted us to come to. What's the trouble,—are we off the prescribed course?"

The officer shook his head, and walked toward the companionway and looked down.

"Want to go below?" politely asked the captain.

"Yes," replied the officer, and the captain led the way down the steps, while the mate, assuming a nonchalant manner which he was far from feeling, lounged idly against the wheel, a target for the curious looks of



U. S. Battleships and Destroyers Passing Out From the Hudson River. The Skyline of New York Is Seen Through the Smoke and Haze

the crews of the launch and the scout patrols which now surrounded the cruiser.

As soon as the officer and the captain were below the former turned in sort of an embarrassed way. "Say, I'm awfully sorry, but I've orders to search the boat."

"That's all right, go ahead," said the captain. "But I don't think you'll find any bombs or contraband goods aboard." And he walked over to the refrigerator and threw the door open. "Eats, nothing but eats, you see."

The officer took a look, grunted, and thrust his hand in a shelf at the side of the refrigerator, drawing out a hard, cylindrical package which he eyed rather suspiciously.

"Oh!" laughed the captain, and he tore off the wrapping paper, disclosing a can of Heinz' Baked Beans. "Just bought it this morning. Nothing explosive about them, as long as the contents remain in the can at least." But the officer, not responding to the laugh, walked into the main cabin, taking a perfunctory look around and poking in the lockers until he spied a kodak. Picking it up he turned to the captain.

"Been taking any shots of the fleet, or anything inside the harbor?"

"Bet your life I didn't fool with any pictures of the fleet; had my hands full trying to dodge you fellows. You did the only shooting out here, you know; however I did make a couple of exposures in the harbor yesterday."

"Where are they?" demanded Mr. Officer.

"Oh, I haven't developed them yet; they're on the film inside the camera."

The officer hesitated, and turned the camera over. "Very sorry, but I guess I'll have to take this camera then."

The captain's smiling countenance went suddenly blank. "But look here, that's a pretty expensive camera. Wouldn't it do just as well if you'd take the film, although there's nothing on it but a couple of snaps, one of a pretty girl on the landing stage, and the other of my friend up there on deck trying to look like Apollo in a bathing suit. Anyhow, I think they're fogged as I didn't set the shutter right."

"Fogged!" exclaimed the officer suspiciously; "I didn't notice any fog around here yesterday." The captain tried to explain, but the officer broke in:

"Oh, I don't know anything about photography, but I'll take your word for it; let's have the film."

The captain, very much relieved, wound up the film, removed it from the camera and handed it to the officer, who put it into his pocket.

"By that same token," declared the captain, "our Uncle Samuel owes me forty-five cents; but I'll make him a contribution of that as an evidence of my patriotism."

After some more perfunctory looks around, the officer returned to the companionway, and when on deck turned and said in an apologetic tone:

"Sorry to have given you all this trouble, and to take that film, but we have to obey orders, you know."

"Don't mention it," retorted the captain, "and if those snapshots develop all right you'll have the picture of a pretty girl to show for your trouble, though I can't say so much about the beauty of the other one," and he jerked his thumb toward the mate.

The officer smilingly made a salute, boarded his craft and gave an order. The boat-hooks let go their hold, the launch shoved off and started ahead, while the patrols, seeing that there was nothing doing, followed suit, their crews evidently disappointed at such a peaceful ending of what promised at first to be something of a scrap.

As soon as the way was clear the cruiser's clutch was once more thrown in, and when they were beyond earshot the mate eagerly questioned the captain.

"Say, what happened below, and what was that you were saying about a film, and what the deuce were you pointing at me for?"

"Oh," laughed the captain, "they evidently thought we were dangerous-looking customers and would bear looking after, so our friend went through things pretty generally. If it hadn't been for my diplomacy he'd have swiped a can of beans and the kodak, but I got him to compromise on the film instead."

"You mean the one you used on me yesterday?"

"Sure thing. Oh, you're slated for the U. S. rogues' gallery all right. I always told you those bow-legs of yours ought to be immortalized; that's why I pointed you out."

"Darn'd better looking legs than yours," growled the mate.

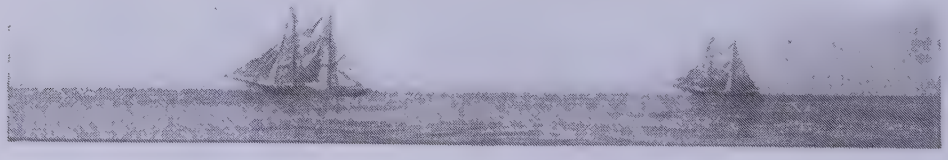
"However, no irons or dungeon cells for us, anyhow, and say, that young officer chap seemed more afraid of us than we were of him. If he had been one of the regular Navy men no doubt we'd have had a good calling down, to say the least. Well, all's well that ends well; but this war adventure has sharpened my appetite, so here goes for some eats," and he disappeared below.

By this time the fleet was pretty well astern, so the captain changed the course for Eatons Point, while up from the galley floated an appetizing aroma, likewise the voice of the mate as he sang:

"The bells of hell go ting-a-ling-a-ling
For you but not for me.
In heaven the angels sing-a-ling-a-ling
For me but not for thee.
Oh, war, where is thy victory?
Oh, peace, where is thy sting?
No ting-a-ling-a-ling, no sting-a-ling-a-ling.
But sing-a-ling-a-ling for me."

That afternoon when the cruiser lay lazily pulling at her anchor in the peaceful, tranquil waters of Lloyds Neck Harbor, the captain bethought himself of that rudely interrupted letter of the morning, so procuring his writing pad, and once more ensconcing himself in the easy deck chair, he continued from where he'd broken off:

"One can never tell. I had just written you that nothing exciting had turned up this cruise and that I was fast getting dopey. Then suddenly things commenced to happen. We were ordered out of the harbor, and afterwards chased, fired on, overhauled and searched. Wouldn't that knock the dope out of you?"



Millions of Tons of Shipping

WHEN the next issue of the Shipping Register is published one name will appear in it as a designer more than any other. Thousands of vessels will be listed as designed by Theodore E. Ferris, and although Mr. Ferris is not getting wealthy, through the immense amount of work he has on hand, he is building to himself a lasting monument and he is doing all he can to supply the demand for ships.

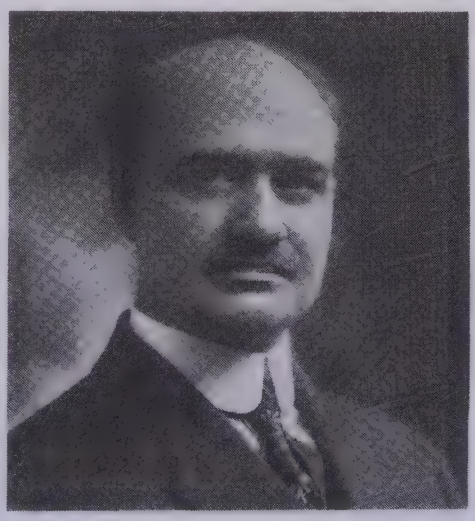
In the course of a few months Uncle Sam will be, next to the British Government, the largest shipowner in the world, and the large majority of the cargo carriers owned by the United States, as well as many of the large passenger vessels which are now being used to carry supplies across the Atlantic, have come from designs by Theodore E. Ferris.

When asked a few days ago how many vessels were now building or contracted for which he had designed, Mr. Ferris did a little quick figuring and then slowly replied, "Somewhere between 2,500,000 and 3,000,000 tons and more are coming every day." Assuming that the average dead weight capacity is 3,000 tons, this means about one thousand vessels.

"Just think for a moment, Mr. Ferris," said his visitor; "suppose these were normal times and you were collecting the usual fees for all this work——"

"Oh, shut up!" quickly shouted the designer; "don't dream."

Three million tons of shipping, some vessels of wood and some of steel, let's say an average cost of $150 a ton. That's very high under normal conditions, but these are war times. High prices are paid for labor and material and the work has to be rushed. At these figures the total amount for this huge fleet will be about half a billion of dollars. Figures have grown beyond all reason and we think now in millions where we used to think in tens.



Theodore E. Ferris, Naval Architect

Mr. Ferris is the Naval Architect of the Emergency Fleet Corporation of the United States Shipping Board. He has given up all his other work, like others have done, to help his country in this time of need, and he not only designs ships of many types and sizes that are to be built in the Government-owned yards, but he has to examine and pass on all the plans submitted by private shipbuilding concerns in all parts of the country. These plans have to bear his "O.K." before the contracts are given for the building of the ships.

Mr. Ferris began first with the wooden vessels but, like Major-General Goethals, he soon saw the limitations of this vessel, and when Henry R. Sutphen suggested, last April, that steel vessels could be turned out in quantities by the standardized methods of fabrication, Mr. Ferris, to whom the suggestion was referred, saw the great possibilities of this plan and gave it his hearty approval. To design a vessel to be built by this new system was something new. It meant great changes. The plans had to be simplified, but after much hard work and many consultations with bridge builders and engineers familiar with structural steel work, the plans were worked out which give strong, staunch vessels, comparatively simple in construction but as strong as any vessels built under the older methods. The Shipping Board approved the scheme and the plans and contracts were placed with three large concerns, for the construction of these standardized steel vessels. The Government is building the plants where these vessels are to be built and the first keels will be laid in a few days at the Newark Bay Ship Yard, which is operated by the Submarine Boat Corporation. At this plant, which is right in the metropolitan district, fifty vessels of 5,000 tons each are to be built at once, and another one hundred and fifty will follow as soon as the first lot is completed. These will be the first of the standardized steel vessels and the first launchings will be early in the Spring.

On the Delaware are the other two Government plants, one owned by the American International Company, which is to build fifty vessels of 7,500 tons each, having a speed of 11.5 knots, and seventy vessels of the same size with a speed of 15 knots. These last named are to be cargo carriers and transports. The Merchant Shipbuilding Company, at Bristol, Pa., has a contract for forty vessels of 9,000 tons each, which will have a speed of 11 knots. In other yards many more steel vessels are being built from standard designs.

Theodore E. Ferris was born at Stamford, Conn., in 1872, of American parents. He studied in the high school and graduated and then attended Greenwich Academy, where he received a technical education and training. He first began ship-building in a yard on Long Island, where he learned the practical work, doing con-

struction work. Later on at the yard of John Roche, at Chester, Pa., he gained more experience and devoted some time to studying drafting and designing. From Chester he went to Baltimore and Philadelphia, working in some of the largest plants, and then went to the Great Lakes district at Chicago and Detroit.

About 1890 he became associated with the late A. Cary Smith and was with that well-known naval architect for about six years, during which time a large number of river and Sound steamers were designed and built in addition to many pleasure craft. About 1898 Mr. Ferris took a position as chief constructor with the Townsend & Downey Company, now the Standard Shipbuilding Company at Shooters Island, New York. In 1903 he again became associated with A. Cary Smith, this time as a partner. From 1912 until the present time Mr. Ferris has designed and supervised the building of more than three hundred merchant and pleasure vessels and at the time all ships building were commandeered by the U. S. Government he had thirty-five large vessels under construction.

In this city the work of building steel cargo carriers will be rushed at the Newark Bay Ship Yard, where the many buildings are now nearing completion. The fabricated parts for these vessels are being made at bridge-building plants and steel mills in all parts of the country. To erect these vessels will require the services of an army of men. Thousands of ships are being built. Mr. Ferris's lot alone, which include the standardized steel vessels, numbers about one thousand vessels. If these average 3,500 tons each, these vessels, if put in one line, would reach for 55 miles. A vessel can be built only as fast as the riveters can work. A 3,000-ton vessel will have about 270,000 rivets, a 5,000-ton vessel about 400,000 rivets. Roughly figured, these thousand vessels will have 20,000,000 rivets. A gang of riveters, four men, can drive and finish about 350 rivets a day in ship-building, so that it would take one gang 1,330 years of 300 working days of eight hours each to do this stupendous work. To finish the work in one year the efforts of more than 5,000 riveters are needed. These figures give some slight idea of the work to be done to build ships, and riveters form only one part of this huge undertaking. Anyone who can handle tools or knows anything about steel work should report at once to the nearest shipyard if he is patriotic and wants to help to win the war.

John W. Kiser's Scout Patrol

What is probably the largest privately owned submarine chaser is now under construction at the yard of the Gas Engine & Power Company at Morris Heights. This vessel, as soon as completed, is to be turned over to the Navy Department and put in active service.

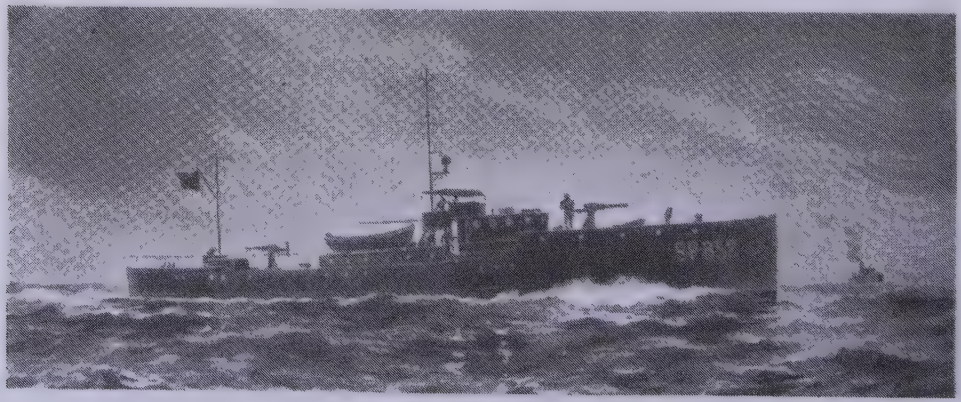
This vessel is for John W. Kiser, Jr., of Chicago. The general dimensions are, length 130 feet, breadth 16 feet and draught 5 feet 6 inches. It is to be a Speedway product in every way. The naval architects and engineers of the Gas Engine & Power Co. planned the vessel.

The motive power will also be a product of this shop.

Mild steel of 60,000 lb tensile strength is used for the plating which, because of its being worked on in-and-out strakes, makes the strongest possible construction. All deck erections are also of steel. No effort has been made to economize in weight, as the object of the builders is to produce a powerful and substantial vessel capable of keeping the sea in any weather.

Speedway engines totaling 750 h.p. on three shafts will be installed. These engines from which a speed of 20 miles an hour will be developed are of the six-cylinder design, having a bore and stroke of 11 by 12 inches. They are similar to the engines installed in the Sabalo, Tarantula, Monaloa, Whirlwind and Privateer, the five largest gasolene-propelled scout patrol boats.

The photographs show this vessel used as a patrol boat and as a yacht. A very attractive interior arrangement has been laid out, and after the war Mr. Kiser will have the vessel changed and a social hall in an after deckhouse added.



John W. Kiser, Jr.'s, 120-Foot Scout Patrol, Built by the Gas Engine & Power Company. Speed 20 M.P.H.

Stock Boats Will Be in Demand

There will be comparatively little special yacht-building this Winter. Conditions do not at present warrant a yachtsman going to the expense and trouble of having a specially-designed vessel built, even if he could find the yard where it could be built. All the builders' yards are crowded with Government work and the same state of affairs exists in the shops of the engine manufacturers. Until this work has been cleared away or the war ends, builders and manufacturers will not be able to undertake much special work. Consequently, there will be a demand for the so-called stock boat. Many builders turn out each season vessels varying in size from the small open launch to the 60-foot cruiser, which they sell readily. Many very able and comfortable craft are built in this way and they do not cost nearly as much as a specially-designed vessel would. These are the days of standardization, and the builders who can turn out good staunch vessels in quantities can undersell those who stick to the old-fashioned system of conducting their business. Yachtsmen will want yachts no matter what happens and these are the boats that will sell. THE RUDDER *herewith gives pictures and descriptions of some of the best of the stock boats.*

High-Speed Runabouts

Will o' the Wisp II is the 1917 champion of Lake George. She is owned by Oscar Daniels, of New York, and last Summer was timed by N. A. W. Crouch, who designed the craft, at 38 miles an hour. She is 37 feet long and 6 feet breadth, and was built by the Leyare Boat Works at Ogdensburg.

The power is furnished by a Model F, eight-cylinder, 180-200-h.p. Sterling engine, of the counterbalanced crank-shaft type, turning a 21 by 33-inch Columbian propeller 1,400 r.p.m. The power generated is sufficient to force the boat out so far that the spray shoots from near the center of the craft, probably half the weight of the engine and the entire forward portion of the boat being without any water support.

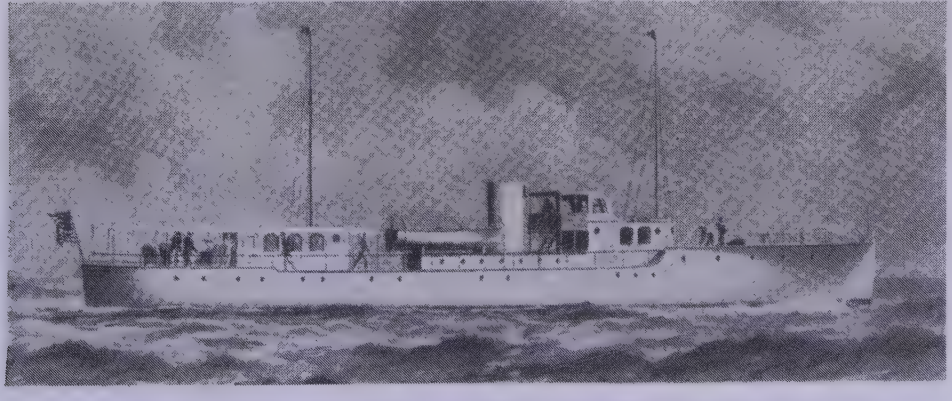
In a series of 15-mile races, held on Saturday afternoons, on Lake George, all Summer long, Will o' the Wisp II demonstrated that she is just enough faster than her rivals, of which there are many at Lake George, to establish an undisputed championship. It has been stated that there is no other boat at Lake George within a mile and a half of the speed of Will o' the Wisp II in these 15-mile races.

If there is one item that assists a fast boat in winning a race, it is the ability to turn stakes. Will o' the Wisp II fairly wraps herself about the buoys at high speed, seeming to be almost flexible as she cuts around the stakes.

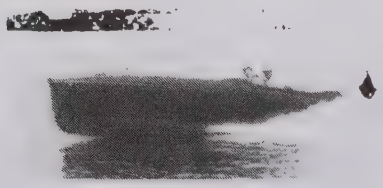


Will o' the Wisp II, 37-Foot Runabout, Oscar Daniels, Owner, Built by Leyare Boat Works and Equipped With a Sterling Engine; Speed 38 M.P.H.

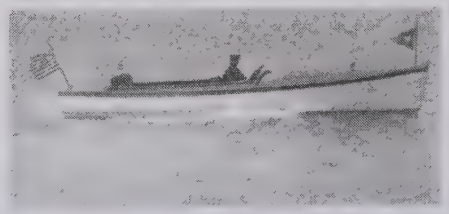
The peer of all contenders at Lake George carries with it an envious distinction, as there are many fast craft on the Lake. Will o' the Wisp II has had to be



130-Foot Scout Patrol, Building For John W. Kiser, Jr., of Chicago, by the Gas Engine & Power Company, Fitted as a Yacht



Sterling II, 26-Foot Runabout, Built by Leyare, From Crouch Designs; Equipped With a Sterling Engine; Speed 33.96 M.P.H.



24-Foot Junior Runabout, Built and Engined by Fay & Bowen; Speed, With 22-H.P. Engine, 16 M.P.H.

always up and going, her big Sterling tuned to perfection, in order to retain her laurels, and the fact that Mr. Daniels drives, himself, having no mechanician aboard, argues well for the engine, which receives little care or attention, yet has run all season practically at top speed.

Another Leyare-built boat with high speed is the Sterling II. She is a Crouch design, V-bottom, 26 feet long by 5 feet 2 inches breadth, and has a record of one mile in 1 minute 46 seconds, which is at the rate of 33.96 miles an hour. Since this trial she has exceeded this speed somewhat, and may be said to be a 35-miler. A Sterling Model F, four-cylinder, counterbalanced crank-shaft engine, of 90-100 h.p., turns an 18 by 28-inch Columbian G propeller 1,510 r.p.m.

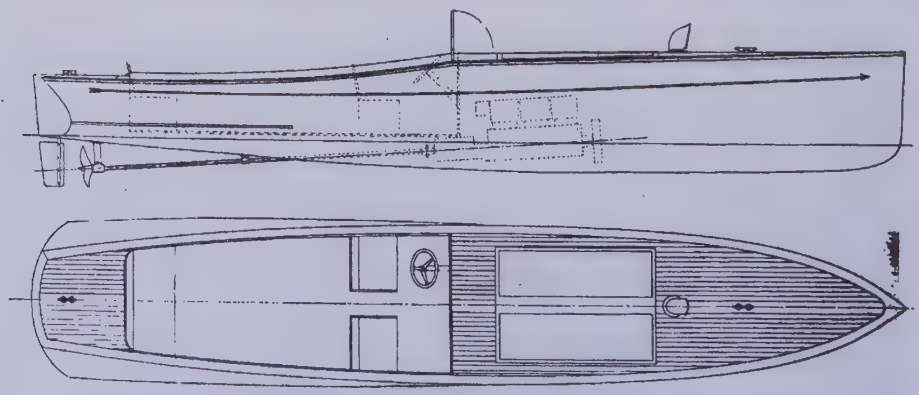
There are few power boats capable of 35 miles an hour when powered with but a four-cylinder, 100-h.p. engine. Notable among the boats this season which attained this desirable speed, is the J. M. R., J. M. Rowland's 35-mile, Crouch design, built by Oscar Van Sant, of Atlantic City, N. J. J. M. R. is also powered with the Model F-4 Sterling engine, which, when built for speed, is equipped with an aluminum upper and lower base, and weighs 1,275 lb complete with electric starter and dynamo.

Three Popular Runabouts

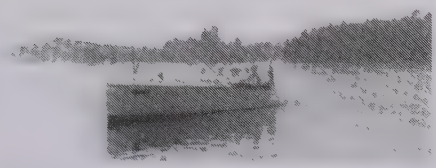
Runabouts are always in demand. They are found on all waters all over the country and furnish much healthful enjoyment. Some are built for speed, because many yachtsmen favor high speed on the water when they can have it. Generally, though, some comfort has to be sacrificed for speed unless the runabout is large and its model costly and elaborate.

About 20 miles an hour is a fair speed for boats of this type, and one built by Fay & Bowen has given great satisfaction wherever it has been used. This boat is 30 feet long over all and 5 feet 6 inches breadth. A glance at its picture shows how attractive it is, with its spotless white hull and mahogany trim and fittings. It is called a raised deck runabout and is fully equipped for salt-water use. The power is a Fay & Bowen Model L-63, six-cylinder, four-cycle engine of 50 h.p. This engine is fitted with an electric starter, so that all one has to do is cast off the mooring line, touch a button and the runabout is off just as an automobile is started. The top work and interior of this boat is finished in mahogany and its speed is 20 miles an hour. The elevation and deck plan show the general arrangements. The engine is under the deck forward, aft of which is a thwartseat for the helmsman with another seat alongside. All controls are at the steering wheel, and between the two seats is an opening through which one can easily pass to the large cockpit further aft. This opening does away with lots of awkward climbing. In the cockpit is a thwartseat at the after end and the rest of the space is filled with wicker chairs. A windshield in front of the helmsman's space and leather upholstery make this boat very comfortable.

The Junior runabout, built by Fay & Bowen, is 24 feet long and 5 feet breadth. It is a stock design with top work and interior finished in mahogany, and the



Side Elevation and Deck Plan of Fay & Bowen 30-Foot Runabout



Family Runabout, 26 Ft. Long, Built and Engined by Fay & Bowen

runabout is driven by a Fay & Bowen Model L-41, four-cylinder, four-cycle engine of 22 h.p., which will give a speed of 16 miles an hour.

The special family runabout is another most attractive stock design built to meet the demand for a thoroughly comfortable and roomy family boat of the runabout type. This boat is 26 feet long and 5 feet breadth. Like the others, it is finished in mahogany and is equipped with the same engine as the Junior runabout, which will give a speed of 14 miles an hour.

26-Foot Albany Runabout

Hoosier II is one of the high-speed runabouts built by the Albany Boat Corporation. This yacht is owned by H. R. Duckwall, of Lake George, Indianapolis and Miami, and is equipped with a Model FS six-cylinder Sterling engine, which gives the boat a speed of 35 miles an hour. The Hoosier II is 35 feet long, 6 feet 8 inches breadth and 27 inches draught.

Mr. Duckwall was initiated to the pleasures of fast boating last season and has become an enthusiast. Hoosier II is so popular with him that the craft is taken everywhere.

She is the first of a series of 35-foot runabouts, turned out by her builders, to be powered with an eight-cylinder Model FS Sterling, and has been a great success. The engine has a manganese bronze upper base and an iron lower base, and is sufficiently powerful to force the



Hoosier II, 35-Foot Albany Runabout, Driven by a Sterling Engine

bow well out. Turning 1,400 r.p.m. 200 h.p. is developed and a speed of 35 miles an hour is obtained.

The use of so much power in a runabout is indicative of the desire for extreme speed and carrying capacity. In these days, when nearly all new cruisers are requisitioned by the Government, as soon as completed, the runabout is practically the only type of boat permissible to own, and it is probable that the number of runabouts will be greatly increased next year.

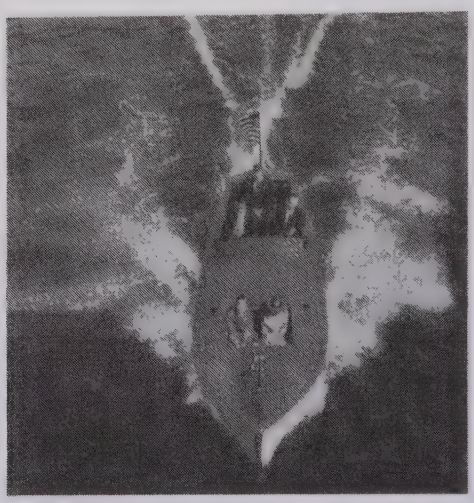
One of the most popular of the stock models, designed and built by the Albany Boat Corporation at Watervliet, N. Y., is the 26-footer, a remarkable picture of which is published herewith. This particular runabout is owned by E. R. Thomas, who has had it shipped to Palm Beach, where it will be used this Winter. Mr. Thomas is an experienced yachtsman and that he has purchased a stock boat is a recommendation for this type.

This runabout is 25 feet 11 inches long and 6 feet 6 inches breadth. It has comfortable accommodations for seating two in the forward cockpit and four or six in the after cockpit. It is equipped with a six-cylinder, 4¼ by 5-inch Wisconsin engine, with full electrical equipment, including electric starter, etc. This engine turns an 18 by 20-inch Columbian Architect wheel 1,500 r.p.m. which gives a speed of 23 miles an hour.

Structurally this boat is up to the latest standards in boat construction, strong and yet not too heavy for the speed requirements. It is thoroughly equipped and has a place for everything needed on a boat of this type, even to tiny lockers for gloves, hats, goggles, glasses, etc. Several boats of this type have been ordered for use in Florida this Winter.



Runabout, 30 Ft. Long, 5 Ft. 6 In. Breadth, Built by Fay & Bowen, Which, With a 50-H.P. Engine, Makes 20 M.P.H.



26-Foot Runabout, Built by Albany Boat Corporation For E. R. Thomas, For Use at Palm Beach

Gaviota, 35-Foot Runabout

A 35-foot runabout is the latest addition to the boats built by the Gas Engine & Power Company, and one named Gaviota, Spanish for sea-gull, has recently been sold to the Standard Oil Company of New Jersey, and will be used for outside work in connection with one of the company's Southern stations. The hull of this boat differs from the stock model inasmuch as an additional copper gasolene tank of 50 gallons capacity was installed, and this boat now has a total capacity of 140 gallons. The hull was also coppered with 12-ounce copper sheets to protect it from the teredo. Other boats of this design are Joseph Riter's Bully Bing, John L. King's Skipalong, which are now in Florida waters, and Colonel E. H. R. Green's Alaska, which is used on the steam yacht United States.

The smallest boat of this type is the 25-foot, 18-mile speedabout, which is 5 feet shorter than the 19-mile Lake runabout. The 32-foot model, having many of the features of the new 35-foot boat, is driven with a 66-h.p. Little Six engine and makes 22 miles an hour. A Model M, 5¾ by 7-inch six-cylinder Speedway engine is used in the new model and it makes 27 miles an hour.

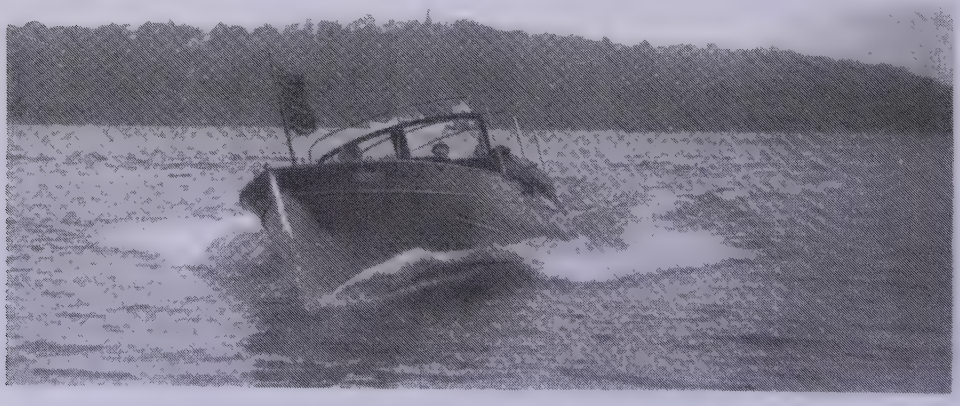
50-Foot Elco Cruiser

The 50-foot Elco cruiser has for several years been one of the most attractive "one-man" cruisers built. It has been gradually developed, each season's model showing the result of past seasons' experience. Many of these yachts have been built and many more will come.

In the accommodations are an owner's compartment, containing a double berth with mattress and spring. A transom seat opposite the berth can be used as an emergency berth. This room also has a mahogany dresser, three large lockers, a desk and alcove shelves. The lavatory adjoining is well equipped and has a full-length pier mirror.

The saloon forward of the owner's room has four bunks, two formed by the transom backs when they are hinged upward. Forward of the saloon is a large galley, where real dinners can be prepared and served with comfort. The ice-box has a capacity of 300 lb of ice. The stove bench is completely lined with asbestos and zinc. Over the galley is a hatch for ventilation and for taking aboard stores.

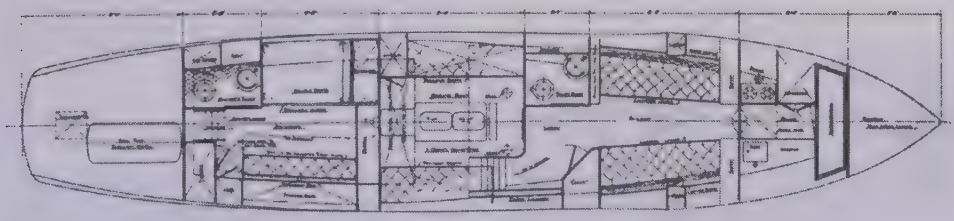
The engine is in an entirely separate compartment amidships. The engine, which is of 60 h.p. turning 600 r.p.m., drives the yacht 13 miles an hour. The reserve gear control and throttle are on deck alongside the steering wheel, thus providing "one-man" control. The gasolene tank will hold 150 gallons of fuel. The yacht is



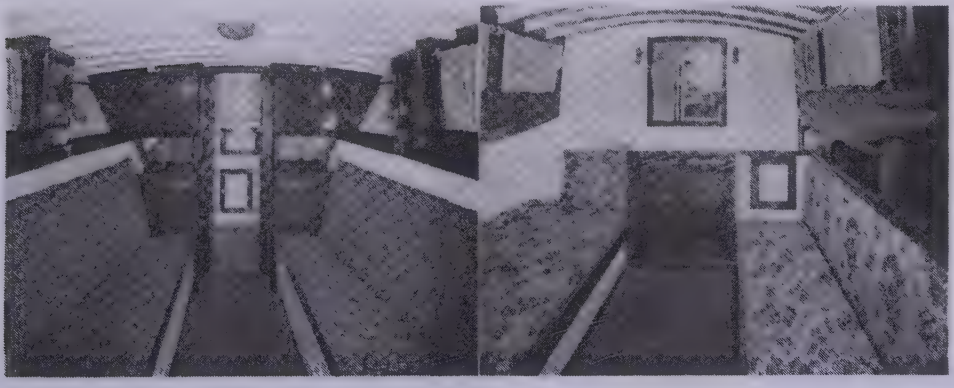
Gaviota, 35-Foot Stock Runabout, Built by the Gas Engine & Power Company. The Picture Shows Her Turning When Going 27 M.P.H.



50-Foot Elco Raised-Deck Cruiser. Equipped With a 60-H.P. Engine, This Yacht Can Make 13 M.P.H.



Accommodation Plan of 50-Foot Elco Cruiser



Interior Views of the 50-Foot Elco Express Cruiser. The Saloon and Galley Is Shown at the Left and One of the Staterooms at the Right

equipped with an Elco self-starting and lighting plant. It has sleeping accommodations for nine persons.

The general dimensions are:

Length o. a.	50	feet	10	inches
Breadth	10	"	4	"
Draught	3	"	4	"

Elkemia, 40-Foot Cruiser

Although designed especially for fishing in Southern waters, the Speedway, a 40-foot, 20-mile cruiser, is interesting because of its adaptability to high-speed cruising service in general.

A feature worthy of comment is the unique housing over the six-cylinder, Model M, Speedway engine. The bridge deck is built to the dimensions of full breadth by about 6 feet fore-and-aft and is 16 inches high. A step is recessed in the starboard end leading to the companionway. The wide seat, comfortably accommodating three persons, is located to port and is so placed



Elkemia, 40-Foot, 20-Mile Cruiser, Built by the Gas Engine & Power Company

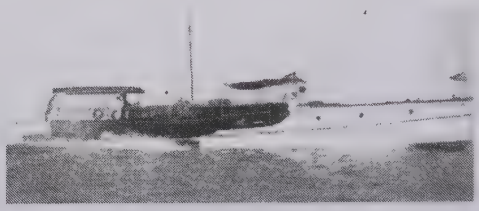
that it leaves part of the bridge to form a seat in the cockpit. A hatch to the engine room, which has 4 feet 6 inches headroom, is in this section. The steering seat is hinged at center and swings at an arc of 180°, permitting access to engine by way of a full-length hinged hatch.

Arrangement provides sleeping accommodations for four persons, and an additional berth is on the starboard side, partly under the bridge. A large toilet is forward of the cabin and a convenient galley is aft.

This cruiser was built by the Gas Engine & Power Company, at Morris Heights.

Laureba, 35-Foot Cruiser

One of the most successful cruisers on the Delaware and in Southern New Jersey waters is the Laureba, owned by H. D. Le Cato. Mr. Le Cato has raced this yacht whenever possible, and as there has been more real racing in Southern New Jersey and on the Delaware River in recent years than in all other parts of the country, Laureba has been kept pretty busy. As a result of all this racing Mr. Le Cato now has a collection of thirty-five prizes won in these open events.



Laureba, a Fay & Bowen Cruiser, Which, With a Sterling Engine, Has Won Many Races

Laureba was built by Fay & Bowen at Geneva, N. Y., and is equipped with a four-cylinder, 5½ by 6¾-inch 35-55-h.p. Sterling engine, which gives the yacht a speed in excess of 13 miles an hour and with this she has not been beaten in a race. This is good cruising speed for a boat 35 feet long and 8 feet breadth considering. The Laureba is of the hunting cabin type and in the picture shown herewith she is having a close race with the Peggy, another well-known Delaware River yacht. The cabin was rebuilt last Winter to give her an up-to-date appearance. Laureba is one example of the boatbuilder's art and exemplifies what may be accomplished by the use of correct materials and excellent workmanship. She is fifteen years old, and still a winner.

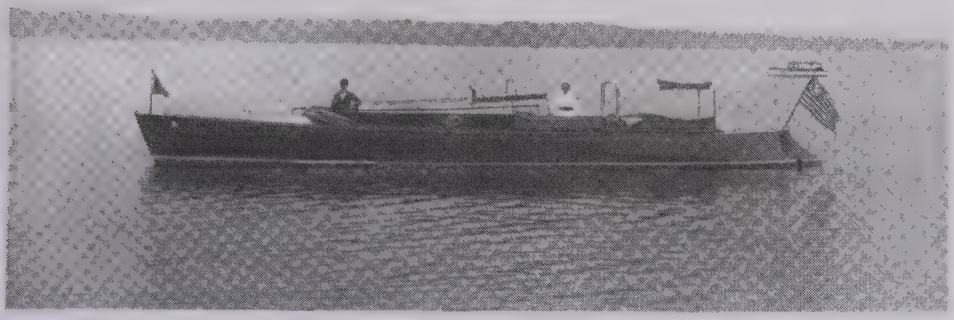
Bonnie, 27-Foot Cruiser

Bonnie, a 27-foot cruiser, has won the admiration or envy of many of the Chicago boating enthusiasts, and her picture shows what an attractive little craft she is. She has traveled more than 1,000 miles this season, and has been out in very rough weather when larger vessels remained at anchor or in harbor.

W. T. Bonfield, her owner, is very enthusiastic over her performances and says that her 12-h.p. two-cylinder, 5 by 6-inch Anderson engine drives her at 9 miles an hour and has never missed yet. Bonnie is 27 feet long, 7 feet breadth and 30 inches draught. She has sleeping accommodations for four, a galley, refrigerator and toilet, and is well suited for cruising in almost any waters.



Bonnie, a 27-Foot Cruiser, Owned by W. T. Bonfield, and Equipped With an Anderson Engine



Thenadra, 50-Foot Runabout, Owned by J. Du Pratt White, Which Makes 28 M.P.H. With an 8-Cyl. Sterling Engine

Thenadra, 50-Foot Runabout

Thenadra, owned by J. Du Pratt White, of New York City, is well known on the Hudson River, particularly in the vicinity of Nyack. She is what may be termed a refined runabout, and although she has seen much service since she was built in 1908 she is still in fine condition. She has been known as Sayonara and Tequilla. Her lines show refinement and originality. The engine compartment forward in the cabin is accessible from the engineer's space and from the cockpit aft. The engine is protected against storms by cravenette covers which make the boat dry even in wet weather, and these covers afford a certain feeling of cozy security under their shelter.

With the exception of the oak frames, every inch of the launch is of mahogany. She is 50 feet long by 7 feet breadth and slips through the water very easily, even when clipping off 28 miles an hour, which she can do with her high-speed Model F eight-cylinder, 5½ by 6¾-inch Sterling engine. This engine usually turns 1,200 r.p.m., which leaves a safety reserve of 200 revolutions. The fuel capacity of Thenadra is large so that she is able to make lengthy runs.

Cinuscan II, 40-Foot Cruiser

Cinuscan II is a 40-foot Great Lakes cruiser, owned by William S. Gilbert, of Cincinnati, O., who has a summer home on Alexandria Bay, where the yacht was used this last season. This yacht is 40 feet long, 9 feet breadth and 4 feet 6 inches draught, and was built by the Great Lakes Boat Building Corporation at Milwaukee, Wis. It has comfortable accommodations for six persons. It is a stock boat, the builders having standardized this type, as they have others of different dimensions. Among those who have purchased this size are: R. T. Wilson, of New York; Milton Clark, of Chicago; H. C. Good, of Moline, Ill.; Alfred I. du Pont, of Wilmington, Del., and Ralph K. Trix, of Detroit.

The accommodations on these boats are very complete. Every inch of space is utilized and it is astonishing how many can be carried without uncomfortable crowding.

The equipment is unique in its completeness of detail, making it a most comfortable craft for extended cruises, and it is a very good sea-boat for its length and breadth.

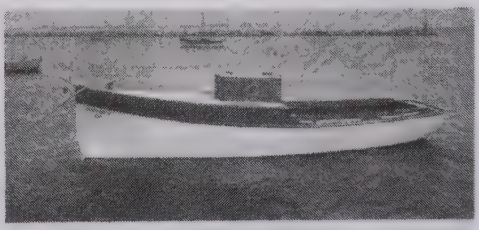
The power is a six-cylinder, 5½ by 6-inch Van Blerck engine, which is installed under the bridge and gives a speed slightly in excess of 20 miles an hour.



Cinuscan II, W. S. Gilbert, Owner, a 40-Foot Cruiser, Built by the Great Lakes Boat Corporation, Which Makes 20 M.P.H. With a 6-Cyl. Van Blerck Engine

Gertrude D, 26-Foot Cruiser

Gertrude D is a 26-foot cruiser, owned by Elmer Dodge, of Block Island, in which he has done considerable cruising, sometimes in very rough weather. This little cruiser is 26 feet long and 9 feet breadth. She is equipped with a double-cylinder 6 by 6-inch Frisbie valve-in-head engine of 16 h.p. The Gertrude D has lots of room under a hunting cabin forward and a very roomy cockpit. She has been very much admired around Block Island and the Western end of Long Island Sound because of her weatherly qualities and the consistent performance of her engine.



Gertrude D, 26-Foot Cruiser, Elmer Dodge, Owner; Equipped With a 16-H.P. Frisbie Engine

American Engines Abroad

Vessels used in foreign ports always look odd to those who are used to the trim-shaped craft seen in local waters, and are always interesting. American-built engines are now to be found everywhere and the export trade will grow wonderfully after the war is over. The Wolverine engine is now used in many foreign ports, and the pictures herewith show the queer craft in which it is doing good work.



Tug Gypsy, Equipped With a 42-H.P. Wolverine Engine

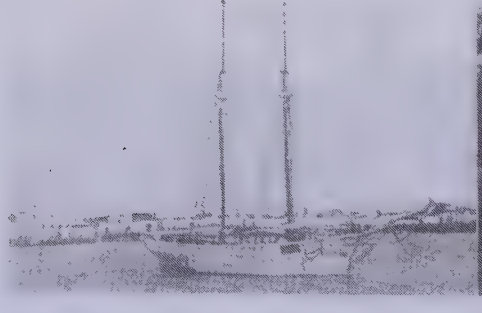


Chalan in Tampico Harbor, Driven by a 14-H.P. Wolverine Engine

At Livingston, Guatemala, two Wolverines of 42 h.p. each are fitted in the tunnel-stern boat Owen, and the picture shows the Owen, which is 90 feet long and 20 feet breadth, towing a barge 80 feet long by 18 feet breadth. These vessels are built of steel and loaded on the two are 3,160 quintales (hundredweights) of coffee. This outfit can go where there is 3 feet depth of water. The Owen works her wheels in tunnels and navigates the Polochic River, a rapid stream of short bends and plentiful snags. It also crosses the Lake of Yazabal, where it is often very rough, and she places her cargo alongside any ships in port.

The Damianin I is an auxiliary schooner equipped with a Wolverine engine of 110 h.p. and this will drive the schooner 8.5 miles an hour. The schooner is shown in the harbor of Valencia, Spain.

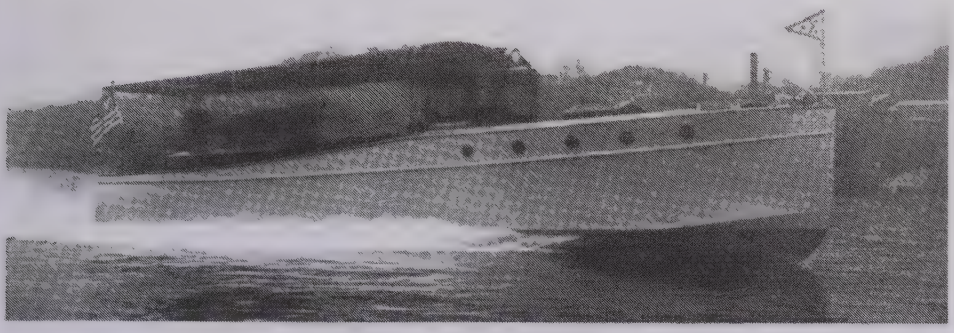
The Gypsy is a very attractive-looking tug which is pushing a barge loaded with case oil over towards a freight steamer to which it is to be transferred. This is in Tampico Harbor. The Gypsy has a 42-h.p. Wolverine engine, which has been in constant daily use for nearly three years. The Chalan, another Tampico vessel, is 40 feet long, 12 feet wide and is equipped with a 14-h.p. Wolverine engine. These vessels and a study of the power in each show to what uses the gasolene engine is now being put, and it is surprising to find how economically they can be run.



Schooner Damianin I at Valencia, Spain; Equipped With a Wolverine Engine of 110 H.P. She Makes 8.5 M.P.H. Under Power



Tunnel-Stern Boat Owen and Barge Loaded With Coffee at Livingston, Guatemala. Owen Has Two Wolverine Engines of 42 H.P. Each



Scout, a 50-Foot Cruiser, Built by the Albany Boat Corporation and Used by U. S. Government Officials at Washington

Scout, 50-Foot Cruiser

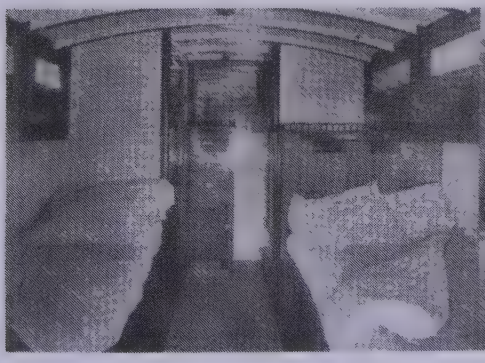
Scout is a 50-foot cruiser, built by the Albany Boat Corporation, of Watervliet, N. Y., and recently delivered to the United States Government at Washington for the use of the executive officers of the Navy to make the run from Washington, D. C., to the Indian Head Proving Grounds. It is necessary very often for officers high in the Navy, as well as executives of other departments of the Government, to make quick trips to the Proving Grounds at Indian Head. By water the distance is 20 miles, while by road it is approximately 60 miles, and the roads are very rough. The Scout makes the trip in one hour, while by road from two to three hours is taken, and time is very valuable just now.

The Government needed a suitable boat for this purpose as quickly as possible, and took one of the standardized Albany 50-foot cruisers and had it adapted to requirements. At trials over the measured course at Albany prior to shipment an average speed of 25.74 miles an hour was obtained. This is 1.74 miles better than the speed guaranteed by the builders.

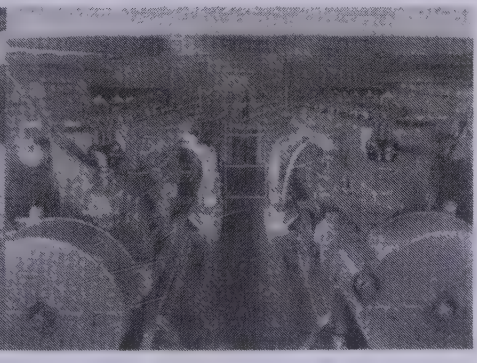
Scout is equipped with a pair of eight-cylinder Van Blerck engines, which turn 1,220 r.p.m. The construction of the boat is exceptionally heavy and the equipment very complete, as it was necessary that this boat have equipment and accommodations for more extended cruises than merely the run from Washington to Indian Head and return should occasion arise.

It is possible to comfortably sleep eight persons and a crew of two without undue crowding on the Scout. The galley equipment is such that from ten to twelve persons can be comfortably fed with as elaborate a meal as may be desired. It was required that the boat should be very seaworthy, regardless of weather and water conditions, as it will be in service all the year round.

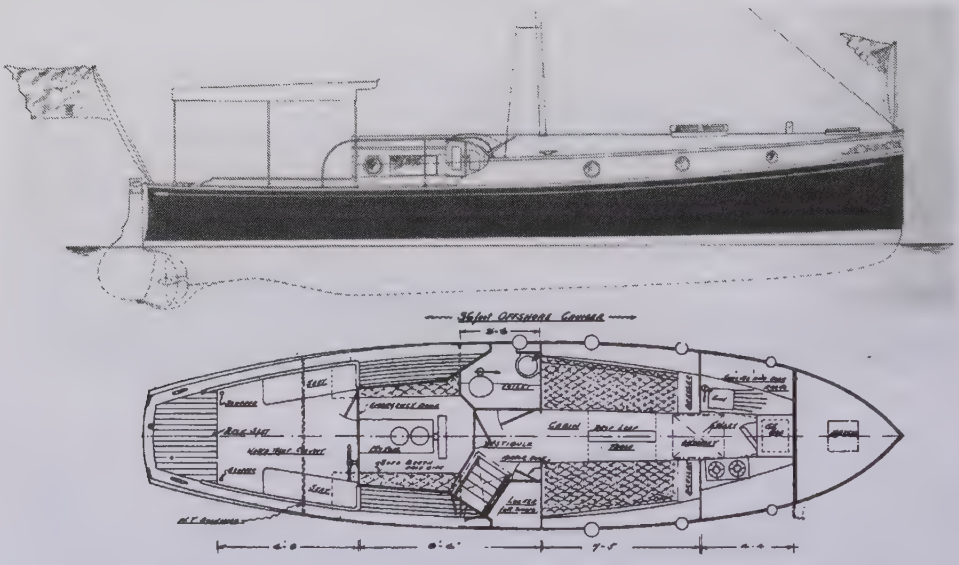
A duplicate of the Scout will shortly be delivered to George Van Cleve, of New York. The interior arrangements of Mr. Van Cleve's boat will be somewhat different from those of the Scout, but the exterior will be the same. Mr. Van Cleve will use the new boat in Florida waters this Winter, making his headquarters at Miami.



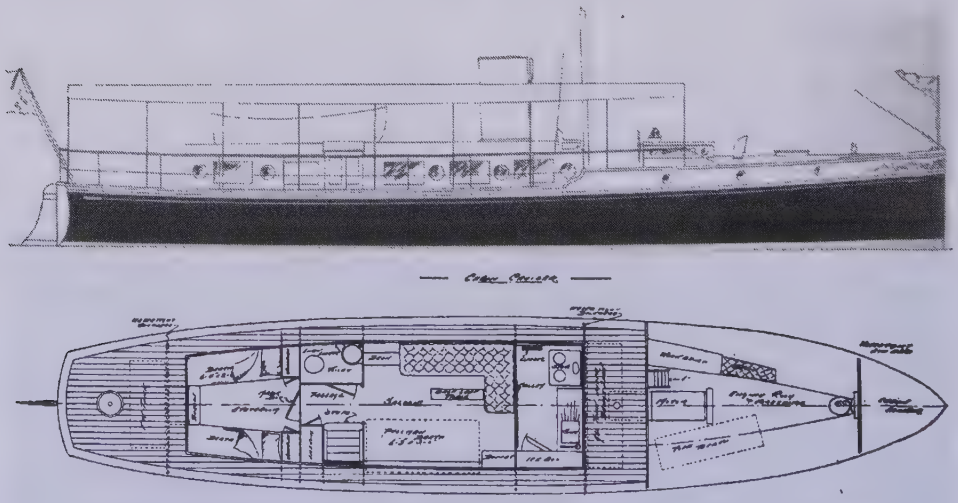
Stateroom on 50-Foot Albany Boat Corporation Cruiser Scout



Two 8-Cyl. Van Blerck Engines in 50-Foot Cruiser Scout



36-Foot Offshore Cruiser, Built by the Luders Marine Construction Company. Length 36 Ft., Breadth 9 Ft., Draught 3 Ft.; Power, 10-16 H.P.; Speed 8.5—9.5 M.P.H.



50-Foot Cabin Cruiser, Built by the Luders Marine Construction Company. Length 50 Ft., Breadth 10 Ft. 3 In., Draught 4 Ft.

Designs

14-Foot 6-Inch W.L. Knockabouts

Last Spring several Summer residents at Biddeford Pool, Maine, commissioned John G. Alden to design a class of able and safe knockabouts, which were to be handled by members of the younger generation. Mr. Alden turned out plans for a boat 14 feet 6 inches on the water-line, which were built by William B. Calderwood, at Manchester, Mass. The plans show a boat of liberal freeboard and plenty of beam for the small sail area of 197 square feet.

This class has proved most satisfactory in every way. The boats are fast, particularly so when on the wind, and are dry and able. They have watertight bulkheads at each end, and carry 700 lb of outside ballast and 200 lb of inside lead. They have been much admired during the Summer wherever they have been seen, and on the trip down from Manchester to Biddeford they attracted the attention of local fishermen, as they in a measure very much resemble the small lobster boat.

The construction is very substantial, and the workmanship throughout is of the best.

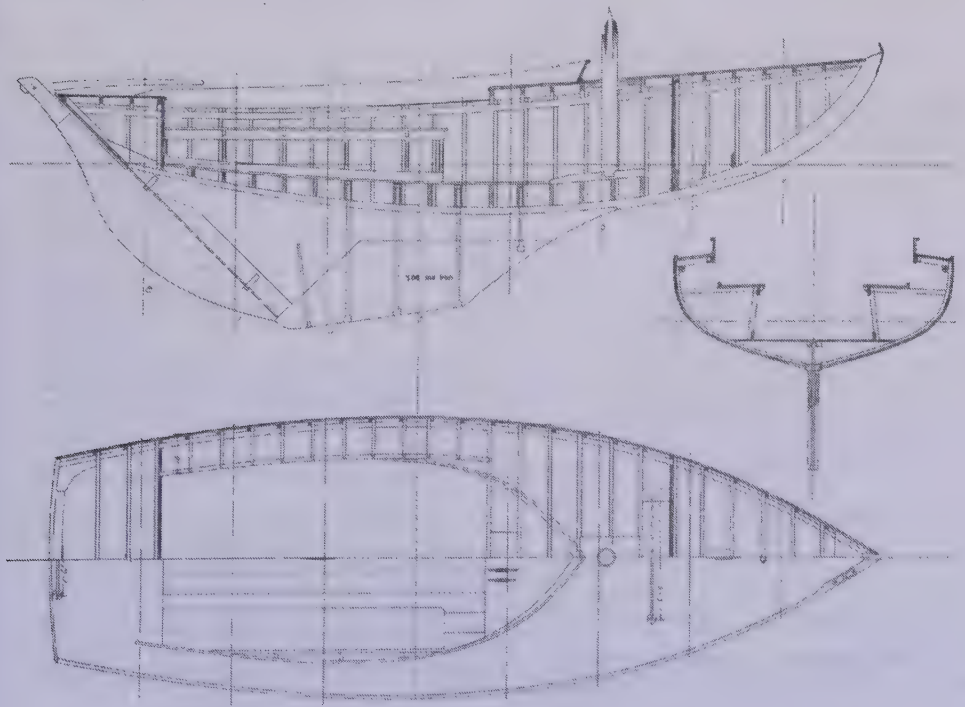
The general dimensions are:

Length o. a.	18 feet 3 inches
Length w. l.	14 " 6 "
Breadth	6 " 3 "
Draught	3 " 7 "

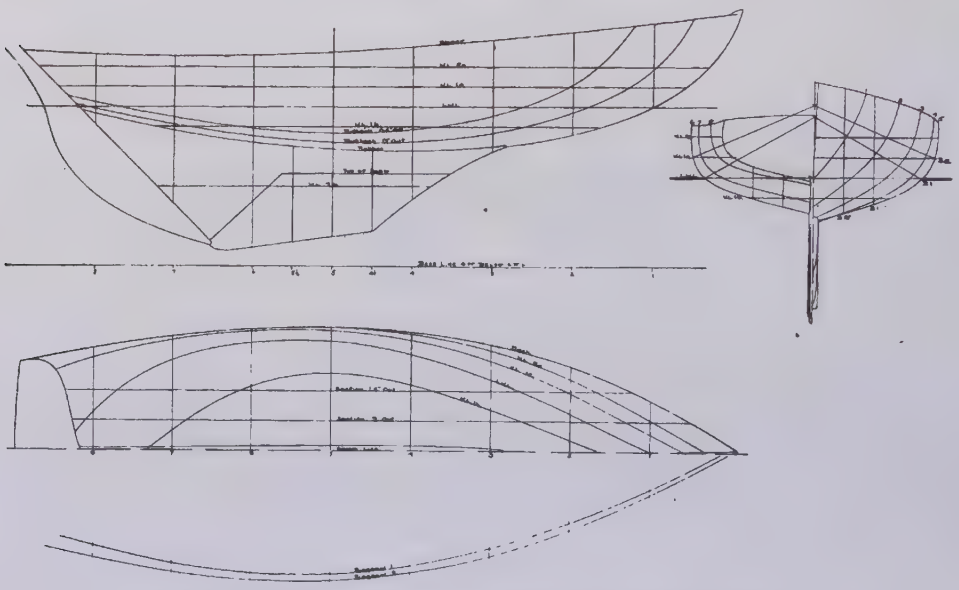
50-Foot Patrol Cruiser Sea Tag

The plans of the 50-foot patrol cruiser Sea Tag, built by the Great Lakes Boat Corporation for Donal Ryerson of Chicago, show fine accommodations for a boat of her size. The vessel embodies all the qualities of seaworthiness and speed, and carries a one-pounder forward and a machine gun aft, so that she is valuable for patrol work.

The hull structure is practically indestructible, by



Construction Plans of One-Design Knockabouts, Designed by John G. Alden, For Yachtsmen of Biddeford Pool, Me.



Lines of Alden 14-Foot 6-Inch Knockabouts, Built by Calderwood For Biddeford Pool Yachtsmen

reason of the use of sawn frames, steam-bent ribs, and battens running from stem to transom, all spaced on short centers, leaving no part of the planking over the size of the palm of the hand unsupported or unprotected. The design, in fact, practically means a double-planked boat. The crew's quarters forward are divided into two compartments, with sleeping accommodations for four, followed by a bridge deck and engine compartment, aft of which is the galley, completely equipped. Adjacent to the galley is the main cabin, with sleeping accommodations for two officers, following which is a submerged cockpit. This arrangement permits of complete enclosure of the engine, with full headroom throughout practically the whole compartment. All controls are carried to the bridge deck for one-man operation.



Sail Plan of 14-Foot 6-Inch Knockabouts Designed For Young Yachtsmen

The crew's quarters, in the fore part of the hull, are provided with two transoms and two pipe berths, and the additional space under the gun cockpit is fitted with two built-in berths. Entrance to the crew's quarters is through either a hatch in the raised deck located directly over the forward compartment, or through a hatch provided in the submerged cockpit over the after cabin.

A depressed gun cockpit is arranged forward of the bridge, the floor of which is strongly re-enforced to support a standard mounting for a one-pounder. Ammunition lockers are carried both on deck and in crew's quarters, so as to permit of rapid handling of the gun.

The galley, aft of the engine compartment, is complete in every respect, including ice-box, two-burner alcohol range with oven, and sink with running water. Ample locker space is provided for dishes, cutlery and provisions.



Alden-Designed 14-Foot 6-Inch Knockabout Under Sail

In the after cabin, or officers' stateroom, are two built-in berths, with box spring cushions. At the after end of this stateroom is a lavatory on the port side, and a full-length clothes locker on the starboard side. The self-bailing cockpit aft of the officers' quarters is reenforced for the mounting of a rapid-fire gun.

The Sea Tag is powered with an eight-cylinder, 6 by 6-inch Van Blerck, which gives her a maximum speed of 25 miles per hour. The capacity of the gasolene tanks permits of a cruising radius of well over 500 miles.

The general dimensions are:

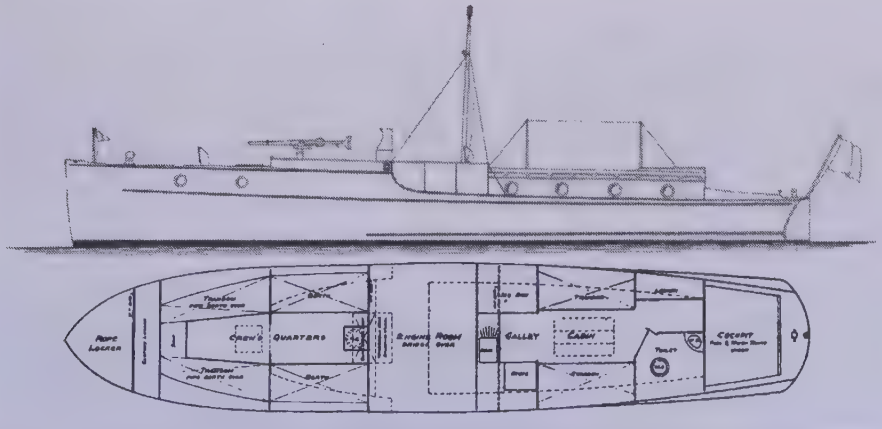
Length	50 feet
Breadth	10 "
Draught	4 "

55-Foot Express Cruiser Nancy

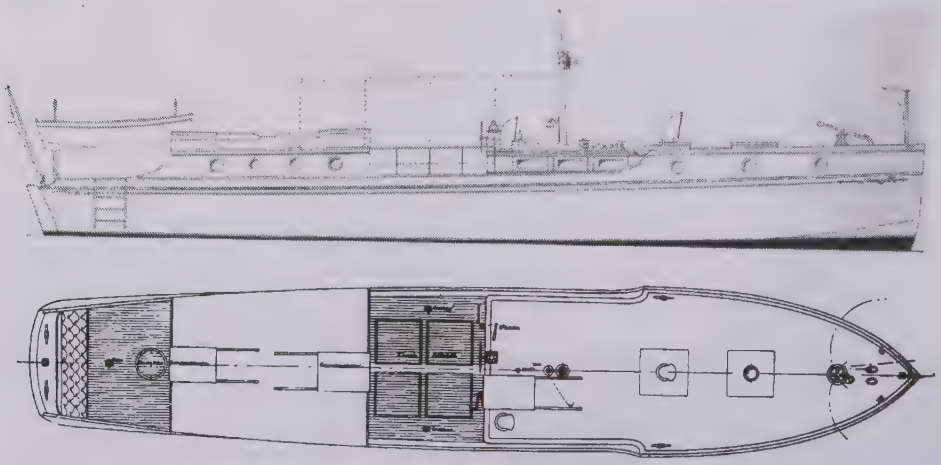
A 55-foot express cruiser has been built by John C. Vanderslice at Camden, N. J., for Felton Bent, of Philadelphia, from designs by J. Murray Watts. The plans, which are published herewith, show a vessel of the hollow V-bottom, wave-collecting type which has proved very successful in the boats of the patrol fleet, such as Nedeva II, built for E. T. Stotesbury, and Little Aie, built for J. Price Wetherill, Jr. This yacht, which is named Nancy, is driven by an eight-cylinder Model F Sterling engine of 200 h.p., which turns a 24 by 26-inch propeller, and at 1,200 r.p.m. gives a speed of 20 miles an hour.

The arrangement plan is also very similar to the Nedeva II, but about 4 tons weight is saved over the equipment of that boat, in electric plant, ice-making plant, etc. The stateroom is aft, with stairs leading to the after cockpit and the bridge deck. Two bunks, two lockers and a large wardrobe are in this room. There is a connecting toilet room forward. The saloon comes forward of the engine room, with a ladder leading up to the bridge deck. There are two wide transoms in this room, and a toilet room is forward on the port side. A sliding door leads into the galley, which is the full width of the boat and 5 feet 4 inches long. Forward of the galley is the forecastle for the crew, with two berths. The yacht is handsomely finished in solid mahogany, all the deck fittings being polished bronze. The construction is of the web-frame type, with double planking.

Nancy has been used around Philadelphia and at the owner's summer home at Squam, near Gloucester, Mass., and has proved a very able and comfortable vessel.



Profile and Arrangement Plans of Sea Tag, a 50-Foot Patrol Cruiser Built For Donal Ryerson by the Great Lakes Boat Corporation, Equipped With an 8-Cyl. Van Blerck Engine



Nancy, a 55-Foot Express Cruiser, Designed by J. Murray Watts For Felton Bent; Powered With a Sterling Engine

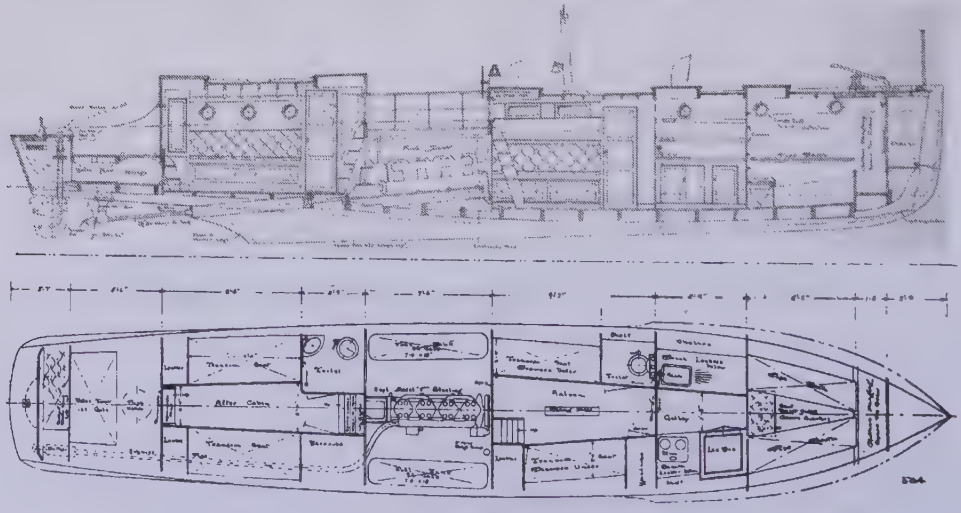
The general dimensions are:

Length o. a.	55 feet 0 inches
Length l. w. l.....	54 " 0 "
Breadth	10 " 6 "
Draught	3 " 6 "

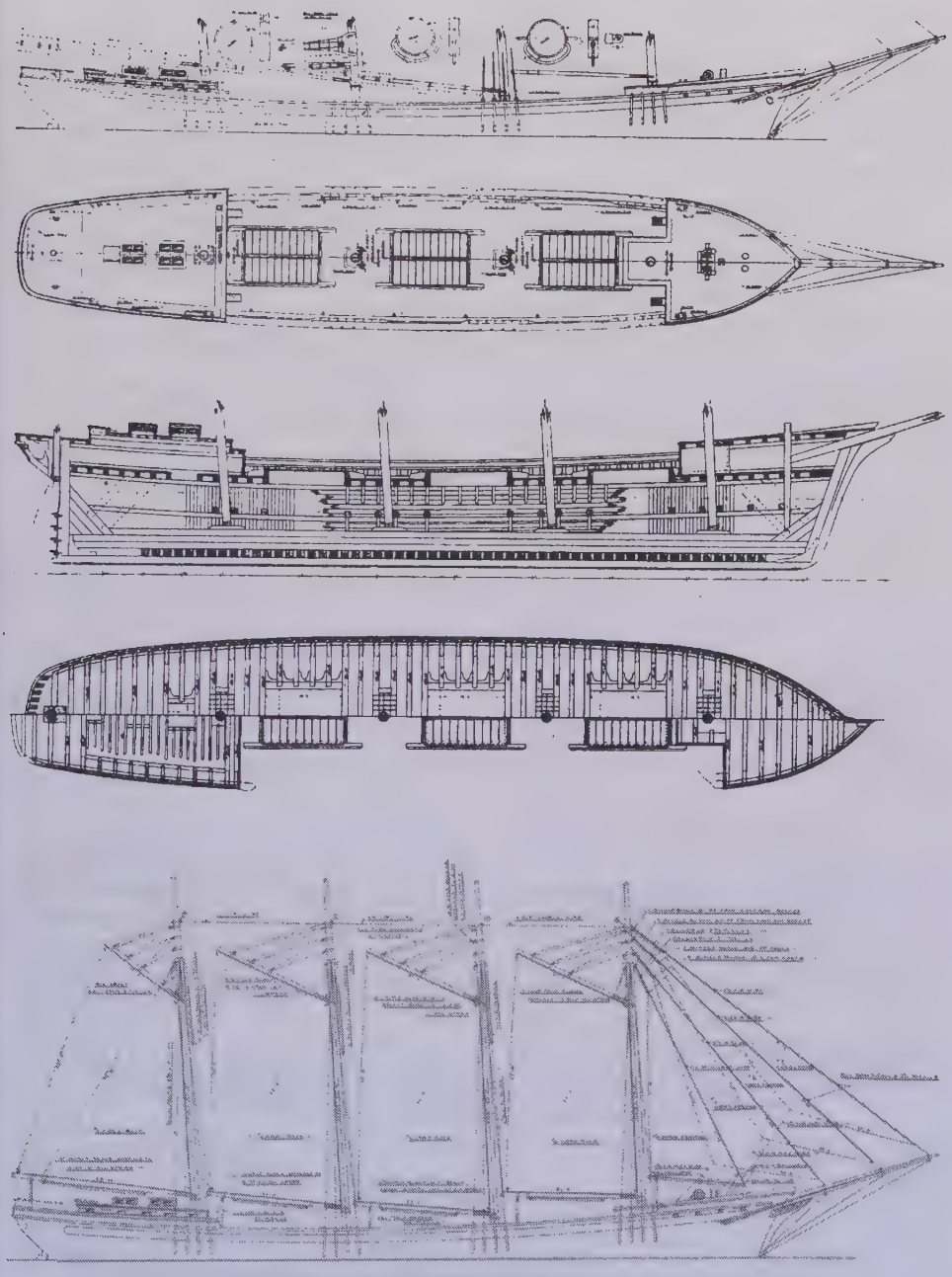
220-Foot Auxiliary Schooner

A 220-foot four-masted auxiliary schooner has been designed by Edson B. Schock and is now being built in a far Western shipyard for use in Southern trade. The lines show the latest and most modern vessel of her type. While designed as an auxiliary, the vessel could be used without the engines and would prove a very successful sailer.

This vessel has exceptionally good carrying capacity and at the same time is not so full in the ends as to make her either a poor sailer or slow under power. It is of the single deck type with widely spaced hold beams. As this vessel is to be used in the tropics there is a raised forecastle and a semi-raised poop. This could easily be made a full-raised poop without changing the lines of the vessel if so desired.



Accommodation Plans of 50-Foot Express Cruiser Nancy



Profile, Deck, Construction and Sail Plans of 220-Foot Auxiliary Schooner Building From Designs by Edson B. Schock

This vessel will be fitted in the most up-to-date manner. There will be two cargo winches for each hatch and the total carrying capacity will be 1,800 tons dead weight.

The general dimensions are:

Length o. a.	220 feet
Breadth	42 "
Depth moulded	21 "

270-Foot Cargo Carrier

A 270-foot full-powered cargo vessel is being built in a Pacific Coast shipyard for the Alaska-Pacific Navigation Company, from designs by Edson B. Schock. This vessel will be used in the Alaska trade. The plans are printed herewith. This vessel has two full decks and about 3,200 tons dead weight carrying capacity.

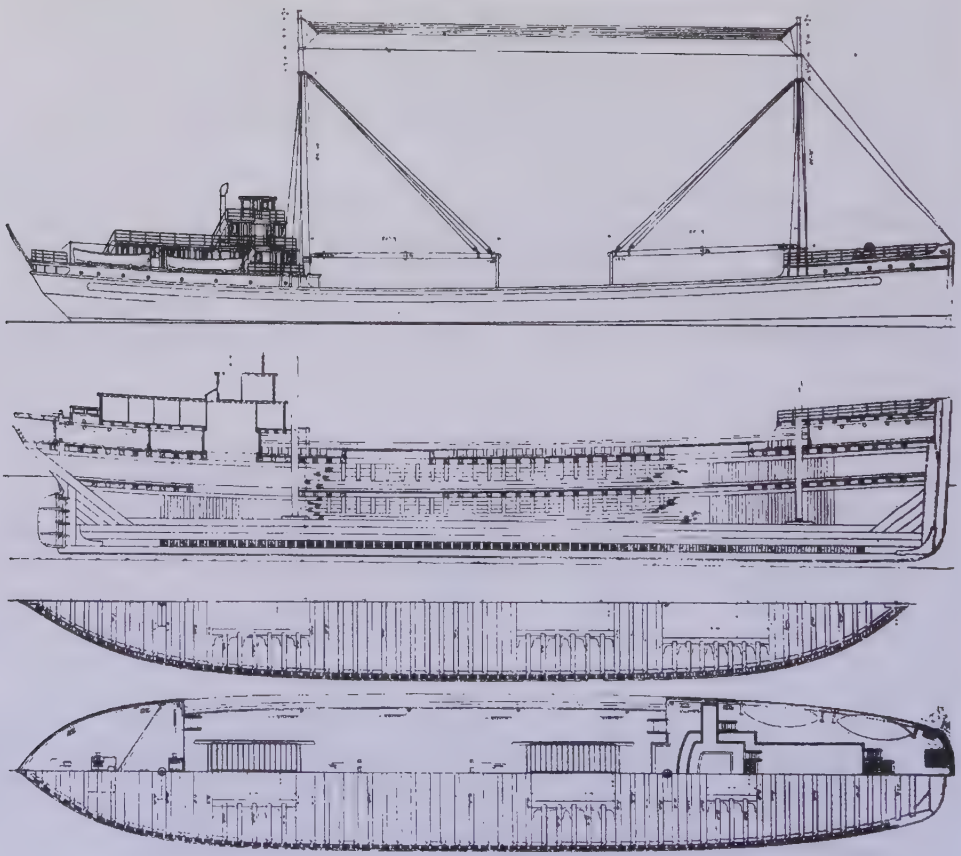
It is being built to the highest class. The keels and keelsons are over 90 feet long, and heavy ceiling and clamps are over 80 feet long, thus showing that the vessel is constructed in the best manner possible.

This vessel will be driven by twin McIntosh-Seymour Diesel engines of 500 h.p. each. The estimated speed is 9.5 knots. The fuel capacity is about 1,000 barrels and this is carried in four tanks. The auxiliary machinery consists of direct-connected generating outfits for lighting, heating and operating electric winches, of which there are four, and an electric windlass. The vessel will be equipped with wireless, four cargo booms and will carry four boats.

The lines show that the model is a most attractive one. Mr. Schock has not only designed a staunch cargo carrier but he has made it attractive too.

The general dimensions are:

Length	270 feet
Breadth	46 "
Depth moulded	26 "



Plans of a 270-Foot Cargo Carrier, Building From Designs by Edson B. Schock; Equipped With McIntosh-Seymour Diesel Engines

Designing of Power Boats

Explained in Terms That the Layman Can Understand

By Chas. Desmond

PART XII

I WILL now explain how the pieces of a boat hull structure are shaped and fastened together.

Keel, stem, deadwood and shaft-log form the center longitudinal member of hull and are the pieces upon which the whole structure is erected. Turn to Fig. 43. On that drawing these pieces are shown put together and fastened in their proper positions.

Each piece of material is shaped in such a manner that when it is assembled in position, the *outside* shape of assembled pieces is exactly as shown on *lines* drawing, and inside shape is such that rabbet can be properly cut and required strength obtained, that the several pieces can be properly fastened together and ribs, floors and planking, can be fitted and fastened in position.

It is, therefore, apparent that these things must be considered when designing construction details of this kind:

1st.—Shape of the outline of assembled pieces.

2d.—Location and shape of rabbet.

3d.—Width and length of material available.

4th.—Strength necessary.

I will take up each of these points in order and explain the way a designer works when designing keel construction details.

He first gets ready a piece of drawing paper of proper size and marks on it *Base—L.W.L.—Mould* (ordinate) *Positions—The Outline of Stem, Keel—The Rabbet—The Shaft Line—and Sheer Line*—taking measurements for these from profile view of lines drawing.

He next considers width of material available and thickness necessary.

The thickness has been decided upon (taken from Table No. 2), but as width and length available are seldom known exactly, the designer usually shapes pieces and arranges scarphs so that *stock* sizes of material can be used.

The Keel

This is the name of piece of material extending from after end of stem to sternpost. Stem and stem-knee is fastened to its forward end and deadwood and shaft-log to its after end.

From table, I learn that *Minimum Depth* of keel for a boat like the one being designed is 6 inches, and that its thickness should be 3¾ inches.

I, therefore, measure 6 inches up from bottom of keel line at point on keel *where rabbet line is nearest to bottom of keel*, and find out the distance this point comes *above* rabbet line. The measurement is, in this instance, 2 inches. It is next necessary to ascertain whether this measure is sufficient for cutting rabbet for planking and foothold for ribs. To ascertain required measure for these, proceed as follows:

To find space required for *rabbet* add to thickness of plank ⅛ inch for each inch.

To find space required for end of rib:

If rib is mortised into keel, double the moulded depth of rib will be the measure.

If rib is to butt against keel, by adding one-eighth to moulded depth of rib, measure will be ascertained.

If rib partly butts against and partly rests on top of keel, one-half moulded depth of rib will be measure required.

By adding measure required for plank and rib, total measure required will be ascertained.

For the design, measures are:

Thickness of plank is ⅞ inch; ⅛ inch added to this gives 1 inch as measure required for rabbet.

Ribs have a moulded depth of 1⅜ inches. Half this measure is ¾ inch, measure required for ribs.

1 inch plus ¾ inch is distance (minimum) keel must extend *above the rabbet line*. (We have 2 inches.)

The line that represents top of keel can now be drawn. In the design this line is located 2 inches above rabbet and is drawn parallel with rabbet and the named distance above it.

When top of keel line is marked, you will see that while forward part of keel is sufficiently narrow to permit it being got out of one piece of material, the after



Fig. 43

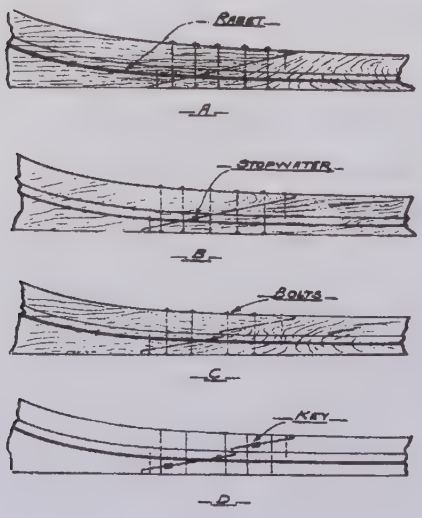


Fig. 44

part is far too wide and will, therefore, have to be made out of three or four pieces of material fastened together.

Fig. 44 shows various methods of fastening keel pieces together.

Illustration *"A"* shows what is called a *"flat-footed"* joint. You will note that pieces are simply laid on top of each other. A joint of this kind should not be used when there is no supporting timber above and below.

"B" illustration shows a *notched* joint. This is the kind of joint usually made when fastening pieces of keel and deadwood together.

"C" illustration shows a more complicated method, called a *"hooked scarph,"* much used in ship-building and when building large cruisers.

"D" illustration shows how any of the above scarphs can be strengthened.

A square hole is cut along joint in such a manner that one-half of hole will be in each piece of timber. Into this hole there is driven, after pieces are joined together and fastened, a well-seasoned piece of wood. This strengthens the scarph regardless of whether it is like *A*, like *B*, or like *C*. This is called *keying*. It is usual to cut hole midway between ends of joint when joint is like *B*. When joint is like *C*, two holes are cut, one at center of each step. *D* addition is seldom used in small power-boat construction.

Length of Keel Scarphs.—The length of a keel scarph should never be less than *six* times moulded measure. Thus, if a keel is 6 inches, length of scarph must be 36 inches.

Fastenings of Scarphs.—Keel scarph fastenings should never be less than ⅛ inch diameter for each inch *thickness* of material.

The fastenings should be placed alternately right and left of a center line, and should be spaced not over 9 inches apart, the end fastenings being located near to ends.

All scarph fastenings should have washers placed under heads of bolts, under both ends of rivets and under nuts. Bolted fastenings are stronger than riveted ones.

The several pieces that make up after end of keel and deadwood can now be laid out. To do this proceed as follows:

First, if it has not already been marked, mark the shaft line in its proper position and at correct angle. This line represents center of shaft. To get correct angle and position for shaft center line, ascertain diameter of propeller that will be used and mark a point on sternpost at a sufficient distance below horntimber to permit propeller to revolve and clear horntimber by at least 1 inch (more, if possible to have more without making angle of shaft line too great) and be fully immersed.

This point will indicate location of after end of shaft center line.

To find position of center of forward end of line, ascertain diameter of flywheel of engine and its location when in place in boat. Then measure up from top of keel at this point a distance equal to one-half diameter of flywheel plus intended depth of floor timbers above keel and not less than 1 inch for clearance. The total of these measures will give vertical location of forward end of shaft line, and a straight line drawn from this point to after one will be the shaft line.

It is important to get this line accurately laid out.

In the design the diameter of propeller is 24 inches, therefore, the measure below bottom of horntimber at sternpost is 13 inches. The diameter of flywheel on a 24-h.p. engine is usually about 22 inches. Half of this diameter is 11 inches. Add 1 inch for clearance and 4 inches for depth of floors above top of keel and we get 16 inches as measure that front end of shaft line is above top of keel. The location of front of flywheel of engine is obtained from lines drawing.

After shaft center line is marked, lines to indicate *top* and *bottom* of shaft-log can be marked.

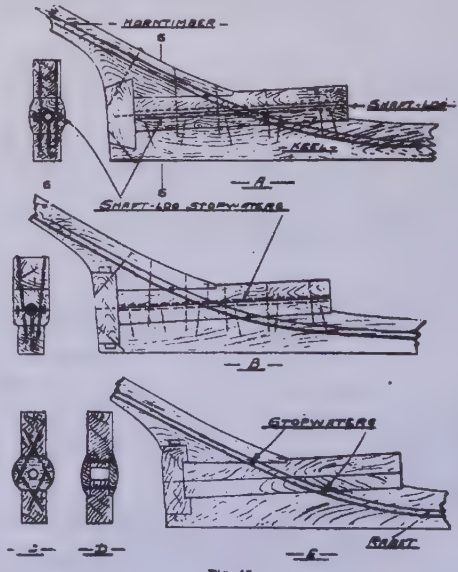


Fig. 45

Shaft-Log

The shaft-log is the piece of material through which shaft passes. It is usually necessary to make shaft-log out of heavier (thicker) material than keel, because there must be sufficient thickness of material to leave ample wood for fastenings each side of shaft hole.

The hole in shaft-log through which propeller shaft passes must be larger than shaft, because propeller shaft must not touch wood at any point, bearings (stern bearing and stuffing-box) placed at each end of log being used to carry shaft and keep it in line.

In a boat of the type being designed, it is usual to make diameter of shaft hole not less than ¼ inch larger than diameter of propeller shaft. In larger boats ⅜ inch should be allowed.

On illustration Fig. 45 I show methods of shaft-log construction.

"A" on illustration Fig. 45 shows details of shaft-log construction suitable for any sized power boat having outside deadwood. This illustration shows a shaft-log made out of two pieces of material, one-half of the shaft hole being taken out of each. You will note that log is made out of thicker material than deadwood and horntimber and has its outside surfaces rounded. When a log is constructed in this manner, the lower piece is first of all fastened to keel or deadwood by means of drift-bolts driven through its center down into keel. The edges of log are then grooved out for the full length, the grooves being placed close to the outer edges.

Into these grooves are placed pieces of soft wood, (called stop-waters) for the purpose of preventing water leaking through joint of log.

The top of piece of log is placed in position and fastened to both lower piece and keel by driving drift-bolts diagonally through both pieces into keel in manner shown on illustration *"A."*

You will note that horntimber is the same thickness as keel and, therefore, top and bottom edges of log have to be rounded to meet edges of keel and horntimber material.

Illustration *"B"* shows construction of log when horntimber is made of the same thickness material that log is made of, therefore, only the lower edges of log have to be rounded, and method of fastening top piece of log is changed to permit drifts being driven through horntimber, both pieces of log and into keel.

Illustration *"C"* shows construction and methods of fastening a shaft-log when it is made out of one piece of material.

Illustration *"D"* shows a method of constructing a shaft opening through deadwood of a boat without the use of a shaft-log. This construction has the defect of preventing use of through fastenings to connect deadwood with horntimber, and for this reason is less desirable than the methods shown by means of illustrations *"A"*, *"B"* and *"C."*

It is well to bear in mind that when heavy pieces, such as log, keel, deadwood, etc., are fastened together with drift-bolts, (these are simply straight pieces of round iron) the drifts should be driven at varying angles (inclining forward, or aft) because, when placed in this position, they will prevent the pieces pulling apart and hold much better than if driven straight or all at one angle. Note inclinations of fastenings shown on illustrations by means of dotted lines.

Depth of shaft-log can be made to suit, but front end of log must extend inside rabbet and top of keel a sufficient distance to permit stuffing-box for shaft to be fitted against it. Of course, the front end of log must be absolutely square and cut at right angles to shaft line. The outer end of *log* is fitted against sternpost in one of the ways shown on illustrations.

The Deadwood Aft

This is the name given to portion of boat that lies between keel and shaft-log; it is, in fact, a portion of keel and sometimes is made of the same piece of wood as keel. When distance from top of keel to bottom of shaft-log is too great to fill with keel plank, the space is filled by using two or more separate pieces of material. The deadwood material is usually same thickness as keel, and is laid out to fill space between top of keel and log. It is generally fastened in place with drifts placed at varying angles.

Sternpost

This is the piece of material fastened to end of keel, deadwood, shaft-log, etc., for the purpose of tying pieces together and fastening shaft bearing to.

The sternpost is set up on keel and extends up to horntimber tying ends of deadwood and log together. It is usually fastened in place by tenoning or scarphing to keel and horntimber in one of the ways illustrated. Drifts are used to secure ends of wood to sternpost.

On illustration Fig. 45, *A*, *B*, *E*, is shown a sternpost in position. On the *A* illustration it is simply dovetailed into place, the ends of logs and deadwood butting against post and being fastened to it with drifts driven into wood diagonally.

Illustration *B* shows method of tenoning post to keel and horntimber.

Illustration *E* shows same as *A*, but having log let into sternpost. The *E* method is best.

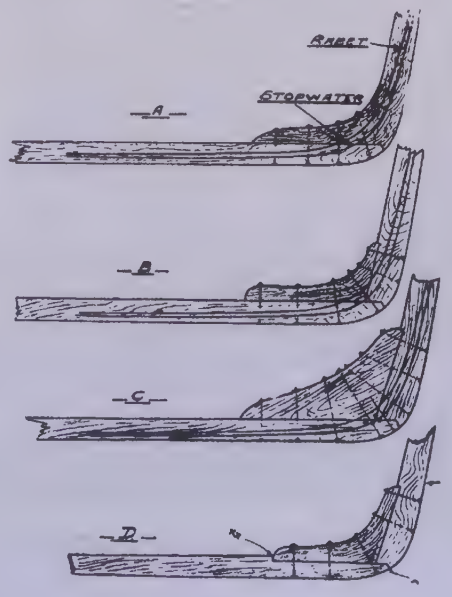


Fig. 46

Horntimber

This is the name of piece of material that fastens to top of deadwood and shaft-log and extends aft to end of boat. It can be the same thickness as keel or thickness of log, and is laid out in the manner that keel is laid out.

Horntimber is fastened to log and deadwood with drifts, and, when fastening it in position, care must be taken to see that drifts are kept clear of shaft hole.

Transom post and knee, or the stern piece and knee, are fastened to horntimber.

Stem and Stem-Knee

These fasten to extreme forward end of keel and can be constructed out of a single piece of curved wood, called a *knee*, or from two or more pieces fastened together.

On the accompanying illustration Fig. 46 various methods of constructing stem and stem-knee are shown.

A shows a stem and knee in one piece, got out of a curved piece of wood, or a natural knee. Note how grain follows curve of knee, thus giving maximum strength without undue weight. Also note how keel is let into knee at its forward end. This prevents end of keel being damaged should it strike any obstruction, and also adds to strength of joint and fastenings.

B shows a stem made out of straight material and a stem-knee out of a curved piece of wood, or a knee. Note direction of grain in both pieces and how the upper end of knee is let into stem.

C shows both stem and knee made out of straight-grained material. Note direction of grain and method of letting upper end of knee into stem.

D illustrates how any method of construction can be strengthened and improved by simply letting after end of knee into keel.

Look at the *A, B, C* construction and you will note that if a stem and knee is constructed as shown on these illustrations, the entire force of any blow or pressure on front of stem will be transferred to joint marked "*X*" and to fastenings, the tendency being to open joint "*X*" and loosen fastenings through keel.

With after end of stem-knee let into keel as shown on *D*, the joint "*X*" is not liable to open because of additional strength given to it by notch "*XX*".

In addition to this, all stem fastenings into keel are strengthened and any blow or pressure exerted on face of stem will be transferred to stem-knee and distributed along foot of knee and against point "*X*" and "*XX*".

When a joint of stem, knee or keel is made in manner shown by bottom of knee *A, B, C* construction, the joint is said to be "*flat-footed*", and if made like *D* it is said to be "*notched*". When possible to do so, "*notched*" joints should be made.

Of the stem and knee construction methods, *A* is best, *B* is next best, then *C*.

Ribs

In small cruisers the ribs are steam-bent to shape. Two very satisfactory methods of fastening ribs to keel are shown on illustration Fig. 47.

The method shown by *A* can be used when depth of keel above rabbet is slightly less than depth of rib. The end of rib is cut to fit partly on top of keel and partly against side of keel.

Illustration *B* shows method that can be used when rabbet is cut close to top edge of keel. You will note that almost all of rib rests upon keel.

Ribs hold planking in place and as the strains they have to resist are mostly transverse, the most efficient shape for a rib is one having depth, or moulded measure, greater than width, or sided measure.

When selecting dimensions for ribs that have to be bent to shape consider amount of bend, or shape, to which the ribs have to be bent and make relative proportions of depth and width such that the material will bend naturally and properly.

It is not a difficult matter to bend pieces of wood to a desired shape, providing the wood used is of a kind that has sufficient strength of fibres to withstand bending strains, is straight-grained and has been well softened with hot water or steam.

For ribs such as are used for the construction of small cruisers white oak or elm are excellent materials. The material is selected for straightness of grain and need not be seasoned, or dry. It is then cut into strips of desired dimensions and length. These strips are then placed in a tight box into which steam is admitted, and after about 20 minutes of steaming are removed one by one and while hot are bent to desired shapes over forms. The ribs must be fastened on forms until cold and can then be removed and fitted in place in the boat.

Ribs are fastened to keel and floor timbers.

Floor Timbers

Floor timbers strengthen boat along keel and tie ribs together. A floor timber is fitted to each pair of ribs. being fastened to ribs with rivets and to keel with drifts or spikes.

The depth of floor timbers above top of keel should never be less than the sided measure of keel, and the floor timbers ahead of midship section must be placed *ahead* of ribs, and those aft of midship section *aft* of ribs.

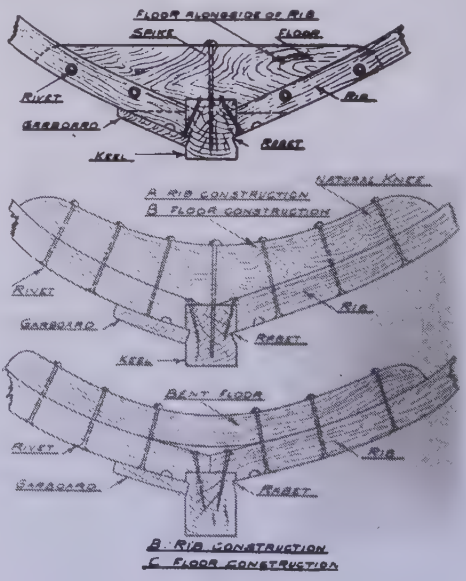


Fig. 47

On illustration Fig. 47 is shown methods for fitting and fastening floor timbers in small boats and cruisers. The most generally used method is shown on top of illustration. The center illustration shows method of fitting floor timbers *on top* of ribs. This method is not good unless natural knee floor timbers are used.

The lowest drawing shows method of fastening *bent* to shape floor timbers on top of ribs. This is an excellent method to use for small boats, but is not good for a cruiser size.

Engine Foundation

An engine foundation is liable to both transverse and longitudinal strains and the best way to resist them is to give ample width to the floors and maximum length to fore-and-aft bearers. In addition to this, the foundations as a whole must be sufficiently strong to resist "panting" strains, or strains causing in and out vibrations, at or near engine. Strains of this kind are principally due to engine and hull vibrations not being in unison, or uniform with each other, and can best be overcome by strengthening hull structure at, or near to the engine.

Fig. 48 shows details of two engine foundation construction methods.

The *B* details is an excellent method to use for heavy engines when it is not possible to get a sufficient width of material to make cross floors in one piece.

The *C* details show how an engine foundation can be strengthened in boats having keelsons, or when the shape of engine flywheel is such that it becomes necessary to stop fore-and-aft bearers, or stringers, back of the flywheel.

With small engines this is not a detriment, but in cases when heavy-duty engines are used, vibrations are likely to occur unless fore-and-aft stringers extend ahead of flywheel.

For the design being prepared, this construction is advisable:

The Keel and Deadwood.—Of two pieces of material, the lower piece being 30 feet long and upper piece (deadwood) being sufficiently wide to extend from keel to under side of shaft-log.

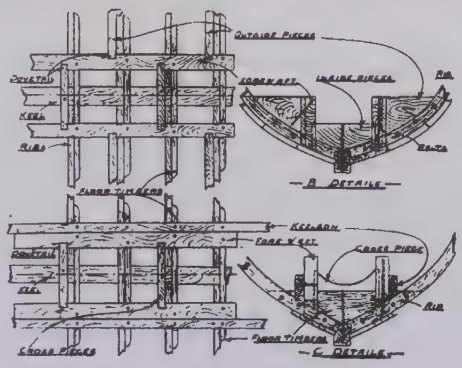


Fig. 48

Pieces are *scarphed* together, the end being notched.

The Log.—Of two pieces constructed in manner shown by illustration *B*. The shaft hole through log will have to be about 1¾ inches, and as about 1⅛ inches of clear wood is required, for fastenings, on each side of hole the thickness of material must be at least 4 inches. Lower piece of log fastened with drifts placed through its center and countersunk *below* shaft hole, and upper piece fastened with drifts placed on each side of hole.

The Sternpost.—Constructed like *A*.

The Horntimber.—Of same dimension material as log and its inner end notched into log. The outer end notched to receive transom-post knee.

The Stem and Knee.—Of two pieces, the grain running in a direction that will enable full strength of material to be utilized.

Transom-Post and Knee.—Of material of same dimensions as keel. The knee of curved material and fastened securely to horntimber with bolts.

(To be Continued)



Judy VII, William Wallace, Owner; Built by Britt Brothers, From Designs by William H. Hand, Jr.; Length 46 Ft., Breadth 9 Ft. 6 In.; Equipped With a 6-Cyl. Duesenberg Engine, Which Turns a 24 x 36-In. Columbian Architect's Wheel 1,400 R.P.M.; Speed 27 M.P.H.

The Tonnage of Small Yachts

THE new War Revenue Law has turned the attention of yachtsmen to the subject of tonnage, a matter in which they have ordinarily little interest. As explained elsewhere, the new law revives the extinct limit of 5 tons, which was abolished in 1906, and yachtsmen throughout the country are asking what this limit means? There are laws without end for the computation of tonnage, but the one referred to in the new law is that under which all documented vessels of the United States have been measured for many years. This is a measurement of the internal capacity of a vessel, obtained by measuring the interior of the hull at six different points, cross-sections, and computing the volume by the usual method for such operations employed by naval architects. Entirely apart from the measurement for tonnage, the Government records three "statutory" dimensions: the length, from the fore part of the outer planking on the side of the stem to the after part of the main sternpost of screw steamers, and to the after part of the rudder-post of all other vessels; measured on the top of the tonnage (upper) deck; the breadth, of the broadest part on the outside of the vessel; and the depth, from the underside of the tonnage deck amidships to the ceiling of the hold. In the majority of the smaller yachts there is a trunk cabin or similar superstructure amidship, and no continuous deck or deck beams; in such cases the depth is measured from an imaginary beam at the level of the gunwale or plank sheer, ignoring the trunk cabin. In the case of the modern raised-deck type the same course should be followed; but it frequently happens that the Customs officials measure the depth from the raised deck, and not from an imaginary beam at the height of the gunwale, thus giving a much greater tonnage than the yachts should have.

The following table, compiled from Lloyd's Register of American Yachts for 1906—the last year in which yachts of under 16 gross tons were documented and measured—will give an idea of the hull dimensions associated with a tonnage of 5 tons and upward:

YACHTS

Name	Tons Net	Tons Gross	L. O. A. Ft.	L. O. A. In.	L. W. L. Ft.	L. W. L. In.	Breadth Ft.	Breadth In.	Depth Ft.	Depth In.	Draught Ft.	Draught In.
[1]Alera	8	11	43	6	30	0	8	10	5	6	6	3
[2]Arabian	8	10	46	6	30	0	10	11	5	4	5	3
Aura	6	6	32	0	29	0	11	3	3	6	6	0
[3]Carina II.	7	7	39	0	25	0	9	7	6	0	5	10
Dione	5	5	29	0	21	1	11	0	3	10	3	0
[4]Drusilla	7	7	52	0	34	4	9	6	3	11	8	10
Elf	7	8	37	0	28	9	10	6	6	2	6	6
Feydeh	5	5	38	0	26	4	9	6	4	2	5	9
Forsyth I.	5	5	31	0	29	0	11	6	3	3	2	9
[5]Iris	5	5	32	0	26	6	12	4	3	9	3	4
[6]Kangaroo	7	8	35	0	28	0	12	0	4	6	4	2
Keewaydin	5	5	36	10	26	2	8	11	6	7	6	9
[7]Little Peter	6	7	36	0	25	0	11	6	3	3	2	6
Martha	6	6	39	0	24	0	11	1	4	6	6	0
[8]Memory	7	7	47	5	32	0	8	10	4	5	7	3
[9]Mopsa	6	6	35	6	27	6	9	6	4	11	6	6
Narona	5	5	38	0	23	6	10	0	4	6	4	6
[10]Nymph	6	6	30	0	26	11	12	3	3	7	2	9
[11]Pappoose III	8	10	49	0	31	0	10	5	5	0	7	4
[12]Saladin	7	8	42	0	30	0	10	0	6	6	7	0

[1] Herreshoff N. Y. Y. C. 30-footer. [2] Herreshoff Buzzards Bay Class. [3] Lawley 25-foot sloop. [4] Herreshoff fin-keel. [5] Mucilage, Hanley cat-boat. [6] Elsworth sloop. [7] Hanley cat and sloop. [8] Herreshoff fin-keel. [9] Burgess cutter. [10] Hanley catboat. [11] Herreshoff Bar Harbor Class. [12] Burgess 30-footer.

It is sad to think that of these yachts, once so well known, very few are to be found in this year's Register. An inspection of the table will show a variety of types, the New York "Thirties", the Hanley racing cat Mucilage and her cruising sister Nymph, the Burgess cutters Saladin and Mopsa; the Herreshoff Buzzards Bay and Bar Harbor Classes and the fin-keels Drusilla and Memory. While the dimensions have no direct relation to the tonnage, from a comparison of dimensions with any given boat it will be possible to judge about how near she comes to the limit of 5 tons. The length, both over all and on the water-line, affects the tonnage, but to a less extent than either breadth or depth; the draught does not count in any way.

In this connection it may be useful to give the approximate dimensions associated with the limit of 16 gross tons, below which documents are not issued to yachts:

SAIL

Name	Tons Net	Tons Gross	L. O. A. Ft.	L. O. A. In.	L. W. L. Ft.	L. W. L. In.	Breadth Ft.	Breadth In.	Depth Ft.	Depth In.	Draught Ft.	Draught In.
Adeltha	14	16	56	3	35	0	12	9	5	10	7	10
Ahmaloka	16	16	62	0	40	0	11	3	6	6	7	0
Alice	14	17	60	0	40	0	12	0	7	0	8	0
Alice	16	16	62	0	40	0	11	0	6	6	7	0
Cossack	14	16	54	0	35	0	12	2	7	3	8	0
Elizabeth	16	16	50	8	35	0	13	6	5	6	7	6
Emily Jane	16	16	56	2	35	0	13	3	5	9	6	6

POWER

Name	Tons Net	Tons Gross	L. O. A. Ft.	L. O. A. In.	L. W. L. Ft.	L. W. L. In.	Breadth Ft.	Breadth In.	Depth Ft.	Depth In.	Draught Ft.	Draught In.
Anita	6	16	51	6	50	0	11	0	3	6	3	0
Arno	12	16	50	0	44	0	9	10	5	7	3	9
Calypso	13	16	53	8	47	6	10	6	4	6	3	8
Catherine	15	16	49	9	44	4	11	10	4	10	3	5
Chiquita	10	16	46	6	45	6	11	0	5	4	3	8
Clover	14	16	40	0	39	4	11	0	5	4	2	4
Elvire	12	16	45	6	43	2	10	6	6	6	3	4

The Collector of Internal Revenue of the Port of New York recently caused a statement to be made public through the newspapers to the effect that yachtsmen were dodging the payment of the tax on their vessels. He said that if the tax were not paid the vessels would be seized. A careful examination of the law fails to show that the collector has power to seize any vessels whose owners do not pay the tax. The yachtsmen as a whole are not dodging anything but are intensely patriotic, as their actions in enrollment in the Navy, in giving their yachts for the service and in active work in all branches of the service prove. About the tax they are in a quandary. The law says the tax "shall be levied, assessed, collected and paid". This would indicate that the Government must first say what amount of tax is to be paid. It would have been better if the collector had asked yacht owners to make a declaration about their yachts and then the amount of tax to be levied could have been determined without a threat of seizure being made.

Owners of vessels under 5 tons and under 50 feet in length should report to the Internal Revenue collector of the district in which the vessel is used, giving the dimensions of such boats and the collectors will notify the owners what the tax is. This law applies to power boats or sailing vessels fitted with engines used for pleasure only, and vessels equipped with outboard engines or detachable engines are exempt from taxation.

Accessories and Subterfuges

By Charles A. Starr

ONE of the things sadly needed by the average small-boat owner is an adequate bilge pump which can be set up and be ready for instant use and yet be out of the way. There are few boats so dry that they do not need occasional pumping and most boats need it regularly. Usually it is not enough for a power pump operated from the shaft, but to get out the ordinary hand bilge pump from a locker, open up the loose plank in the flooring or deck, run a hose through a port-hole or over the coaming, is cumbersome. It is more when one springs a leak or ships a wave when all alone in a boat.

I have examined a number of rotary pumps, both power and hand, and none of them seems quite to fill the bill. True, several makes of rotary pump, attached to the shaft, work all right, though prone to get out of order, and likewise, a three-way cock on the intake pipe of the cooling system, with a hose to the bilge, will permit of the engine doing the work. The latter has the objection of introducing dirt and grease to pump and water chamber of the engine and then on to exhaust pipe and muffler, grinding the pump plunger, or valve, and leaving a scum of grease all the way through, which will in time clog things. A hand-operated rotary pump is all right if it can be installed only a foot or so from bilge water, but that is inconvenient. When the pump is mounted higher it will not work satisfactorily more than one season, if that long.

A friend at the New York Motor Boat Club has solved the matter satisfactorily for his boat. The limber holes permit the water to run to one low compartment of the bilge, just in front of the engine. Alongside a bulkhead he mounted permanently a hand pump with double hose. The pump foot was screwed fast to the floor planking, and a couple of supporting clamps held the pump firm. The lower or intake hose was cut just the right length to reach the bottom of the bilge through a hole bored through the floor planking and was fitted with a strainer end. The other hose he conducted to a brass inlet connection mounted in the planking above the water-line and so placed that the hose would interfere with nothing else. When he finds water in the bilge he gives a few strokes to the pump and it does the work. It is always ready and yet out of the way and needs no more attention than the ordinary pump.



Bilge Pump

At the last power-boat show I was much interested in the Little Hercules bilge pump, made by the company of that name at Greenport, L. I., and exhibited in the Durkee booth. It works on the vacuum cup principle, and I particularly liked the smaller size, operated by foot pressure and so arranged that pressure may be applied direct to the pump by the foot, or by means of a push rod where the deck or flooring is some distance from the bilge water. One pipe leads to the bottom of the bilge and the other through the planking above waterline; it may also be installed to discharge below the waterline. The pump is made in larger sizes, to be operated by a lever, and from 10 to 100 gallons per minute can be taken care of.



Foot-Pressure Pump

The boat which takes in much water needs caulking or some other repair, which should be attended to at once, for constant pumping gets on one's nerves. I had trouble this year with a leaky exhaust outlet, just at the water-line. The old caulking had dried out, but I did not discover it until after going into commission, when the vibration shook it loose. New caulking—wicking and white lead—soon ended the trouble. Sometimes the caulking along the garboard will loosen from an unusual strain and leak just enough to be annoying. It is a case of hauling out usually, though I have heard of a new bitumen paint, hardly on the market yet, which may be applied to the inside of the boat and which will hold for quite a long time—forever, if it can be put on hot to dry wood. More will be said about this in a later number.

In an article on fires in the November issue, I spoke of putting a cap of miner's safety gauze on the carbureter air intake. This should not be a flat cap the size of the intake pipe or opening. It is of such fine mesh that not nearly as much air may pass through as the intake is supposed to permit. Therefore, the cap must be made something the shape of an atomizer or horn-bulb, or the carbureter will not work right. It will work all right if the cap is too large, so it is well to err in that direction.

The J. H. Curtiss Company is making much of their "lead pipe cinch," which, being interpreted, means a system of installation for their toilet fixtures without hiring a plumber—oh, joy! In effect it applies the principle of the compression couplings for gas and air pipes and is working all right. But I know a man who put over a "lead pipe cinch" on the plumber by making his connections with rubber hose. That is, he connected up the ends of the lead pipe with hose, both on the intake and outlet pipes, and while it usually means new pieces of hose each year, he has had no trouble with it, and it is easy to get at if the pipes become clogged.

In this connection, the Dole Manufacturing Company, of Chicago, has a double compression coupling for air or gas pipes, which will make for tight joints.

I wonder if anyone has had trouble with their three-cylinder engine, installed on an incline. I have a Palmer three-cylinder, 8-h.p. Q.3 engine which I could not get to fire right in the third cylinder. It seemed to get too much oil, or gas, or both, and the spark plug would not stay clean more than an hour when running. I could not get the needle valve adjusted so that all three cylinders would fire properly. One day I met Gus Blomgren, Palmer salesman, and told him my woes, and he said at

once: "Put on an auxiliary air check valve and you will have no more trouble." I had one installed and it was as Blomgren said. The engine started on the first turn over and ran for several hours without a cough. It did end the trouble. I saw Blomgren later and asked why the auxiliary check valve was not made a part of the regular equipment. He replied that it was one season, but it made so much trouble that it had to be abandoned. Engine owners would forget to shut off the valve before trying to start, and cussed the engine makers for a while. Then they would call the office and Blomgren would be sent out to start the engine. Invariably it was the open auxiliary. All of which proves the truth of the comment of another salesman mentioned last month in this department,—that buyers would not read and remember the instructions in the manufacturer's booklets and circulars.

I ran across a good idea recently at one of the East River boatyards. It was the use of hanger bolts for engine installation, instead of lag-screws. It has the advantage of a permanent screw end in the engine bed, with less likelihood of its loosening up, and the much greater ease of unscrewing a nut than of turning out a 4-inch lag-screw. It is known by everyone that a lag-screw will rust and stick and often break off, and in general is provocative of unseemly language. Besides, there is a great saving in time.

Small boats rarely have good galley accommodations, yet even a tiny cruiser may have facilities for producing hot dishes, with very little expense or inconvenience. My first galley consisted of an Alpha one-burner alcohol stove, which was put on a locker in the cockpit for lack of a more suitable place; but on that stove I have cooked meals for cruises extending over a couple of weeks,—bacon and eggs, potatoes, cereal, coffee, chops, steaks,—and though each dish had to be cooked in turn it was done so quickly that it mattered little. Prepared coffee, that needs but boiling water to make it ready, helped, for no time was lost in bringing it to a boil, and, you know, if you wash off an eggshell before boiling it, the water is clean enough to make coffee.

There are many stoves made for small boats and for those of more pretentious proportions. If it were not war times and alcohol were not in such demand for munitions manufacture, I should advise every one to use an alcohol stove, after an experience of two seasons with a Manning, Bowman & Co. two-burner alcohol stove. But until the war is over, it might be just as well to stick to the kerosene burner, even if it does make the cabin smelly, though the Jewell, Lovett and some other kerosene stoves, which use a pressure system, are free from this objection if cared for properly.



Alcohol Stove

Not having a regularly appointed galley space in my boat, I had a galvanized iron "box" made just large enough to hold the stove and high enough to make safe the surrounding woodwork when the stove is in action. There is a front which lets down and a lid which lifts up, so that the stove, while accessible, can be kept free from draughts, if necessary; also the box keeps the stove from injury when not in use.

Where a stove is permanently set, it is well to remove the reservoir, fasten it to the side of the galley space out of the way, and run piping to connect with the stove. Solderless couplings make this feasible at a minimum of expense. It is well, however, to put in a stop-cock underneath the reservoir, so that the pipe may be cleaned without emptying the reservoir.



Larchmont Y. C. Regatta Committee Managing a Race on Board the Stake-Boat

Navigation for Beginners

By Clarence W. de Linden

Lieutenant-Commander U. S. Naval Reserve

PART III

(Continued from October)

NOW that we have taken considerable pains, time and patience to explain the compass and its construction and all material elements relating to it, we will proceed with the practical use of this most important instrument in navigation and tell how to use it safely and correctly.

One of the first things to do is to find its error and apply the corrections accurately and on the right side of the true course, or compass course. Each has a different application according to circumstances. Be sure you understand how your corrections are to be applied before you apply them. To apply a correction on your course in the wrong direction is worse than not applying it at all. If your correction were 20° to right and you were to apply it 20° left, your mistake would be double or 40°. Then where would you be if you were on Long Island Sound and your boat was making 20 miles an hour? No ocean is large enough to stand such an error and there is no excuse for such an error being made.

To prevent such mistakes as these, I will lay down a few rules with some simple explanations that can be understood in the kindergarten. First of all you must stand in the center of the compass (or imagine that you do). You will have to imagine many things before I am finished with you. Stand on the center line of the compass and face toward the point with the name of the course you are going to correct.



Fig. 1

If your course is N. 20° E., face to the North; if the course is S. 20° E., face the South. Now stand there and listen to me very attentively. When facing North the East point of the compass is on your right hand and the West point on your left hand; but when facing South the West point of the compass will be on your right and the East on your left. Remember this at all times, as there will be frequent reference to it, using the letters R for right and L for left.

When you are correcting your course keep this diagram in front of you until you have it indelibly impressed on your mind. Your chart is marked true course and you desire to steer a compass course to correspond to the true course. As before stated, you will find on the "true" chart a variation curve passing through or near your locality; on the magnetic chart the compass rose is usually marked "variation so many degrees East or West and increasing or decreasing so many minutes annually". Now if you have your intended track marked on the chart, you lay the edge of your parallel ruler on this line and then move your ruler to the compass rose and see what course you must steer to keep your vessel on the above line. If the chart is "true" the line and course are true, but if a magnetic chart the line is magnetic. Your compass is neither magnetic nor true and it is up to you to make it suit the occasion.

If your line on the chart shows a true course East, and the variation curve tells you that there is a 10° variation Westerly, you will apply it to your true course in the following manner:

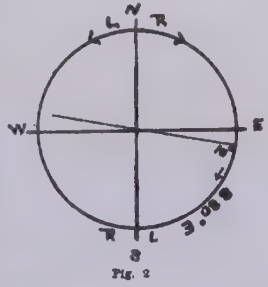


Fig. 2

If your variation is West allow it to the right of your true course, which in the present case would make your course S. 80° E. or E. by S. magnetic. Remember, if you apply the variation to the true course the result is magnetic course.

Now if our old boat were built of wood only our troubles would end right here, as far as our course is concerned. The vessel, however, is not built of wood and we have some more work and trouble with another enemy, called deviation. I told you in the last article what caused the deviation and I hope you have not forgotten. I will tell you a little more to refresh your memory, and remember I am writing this in the war zone or in the Bay of Biscay, so you must not be surprised if I am not as good-natured as you would like me to be; but let us back to our deviation. Deviation is caused by the attractions of the iron and steel of which the vessel is wholly or partly constructed. There are several of these attractions, horizontal, vertical and fore-and-aft, but for the present we do not care how many there are; it is sufficient that there is a deviation. I told you that you must apply your variation to the right of the true course if it is a Westerly variation, and to the left if it is Easterly, in order to obtain the magnetic course. Remember this—variation and deviation are applied in the same manner:—Easterly variation and deviation to the left, Westerly

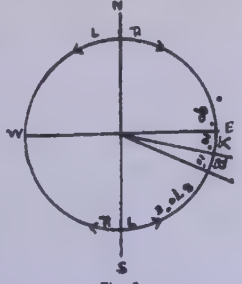


Fig. 3

variation and deviation to the right, in order to obtain the magnetic course from the true course. In Fig. 2 we showed 10° variation to the right because it was Westerly. By the azimuth we discovered that our compass had a 10° Westerly deviation which, with the 10° Westerly variation, makes a total error of 20° Westerly. The deviation applied to the right of the magnetic course S. 80° E. will give us a compass course of S. 70° E. This is the course we must maintain if we are to sail on the line which we marked on the chart.

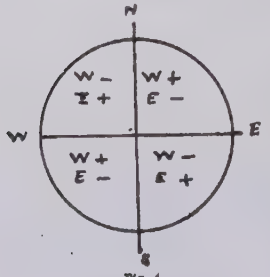


Fig. 4
To Get Compass Course From True Course

You will observe that your compass course made is 70° and between East and South, or S. 70° E. Keep in mind that within the angle S. to E. you always subtract your Westerly or right corrections, and add your left or Easterly corrections, to obtain the compass course, and the reverse of this rule applies to obtain the true course from the compass course.

Fig. 4 indicates how to correct a true course to a compass course in the various quarters.

Fig. 5 indicates how to correct a compass course to a true course.

You will see from the figures which quarter contains your course and apply your corrections according to the signs given, and you will have your result with any course or angle of compass without writing down a single figure.

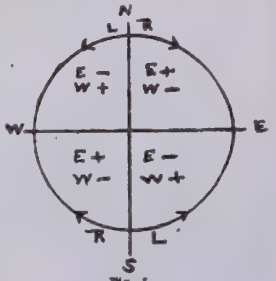


Fig. 5
To Get True Course From Compass Course

Do not forget to have all these in your head and not on paper only. Study each figure carefully and remember each one. After a little time and patience you will have learned it all and will say, "Oh, how simple." I have much more to tell to my friends and the best part is to come, even if it is harder.

(*To be Continued*)

Heavy-Oil Engines for Cargo Carriers

Several heavy-duty marine Diesel type oil engines built by the McIntosh & Seymour Corporation, of Auburn, N. Y., are now being shipped to the Pacific Coast to be installed in cargo carriers building there. Two of these are to be put in a vessel building at Seattle from designs by Edson B. Schock, plans of which appear on page 760 of this issue of THE RUDDER.

This corporation has built high-grade machinery for thirty-two years and has built vertical steam engines up to 10,000 h.p. They have now engineers whose experience in the Diesel engine field has extended over sixteen years, and are turning out these engines as fast as possible to meet the growing demands.

The engines for the cargo carriers are of 500 h.p., are of the four-cycle single-acting type and are directly reversing. The form of framing is such as to give the greatest stiffness with minimum weight, and reduces the size of the base at the same time decreasing the weight of the engine.

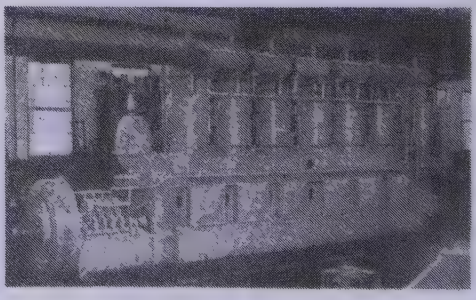
The air for atomizing the fuel for the working cylinders as well as that required for maneuvering is furnished by a three-stage compressor, placed at the forward end of the engine and direct driven from the engine. In cases where the engines are used for twin-screw vessels this compressor is of ample size to supply atomizing and maneuvering power for both engines.

The valves and cages are all accessible and removable as a unit, making their removal a simple operation. The thrust bearing is carried in a substantial base, bolted securely to the engine, and contains a large bearing located at its after end and making it possible to carry the flywheel overhung.

The principal features of this engine are, the thorough preparation of the fuel, which has proven to be very effective on the marine and stationary engines, the thorough cooling of the upper part of the liner and cylinder head. The cooling system is so arranged that salt water can be used for cooling purposes without coming in contact with steel studs or any parts liable to be affected by it.

The average time consumed from full speed ahead to full speed astern for fifty maneuvers is 8 seconds. The fuel consumption is a trifle over .4 of fuel oil per b.h.p. hour, when operated at rated speed and rated load. It has also been demonstrated that these engines are capable of a reduction in speed of 60 per cent.

The standard sizes built are 300, 500, 750 and 1,350 b.h.p.


McIntosh-Seymour Heavy-Oil Engine

Hurrah's Nest

"A place for everything and nothing in its place!" Letters for insertion under this head are limited to two hundred and fifty words, and must be accompanied by correct name and address of writer. Address the Hurrah's Nest, care Editor THE RUDDER, 254 West 34th Street, New York City, U. S. A.

War to Improve Yachting

Editor of THE RUDDER:

There are lots of things over here which would greatly interest you, but the censor will only let me mention a few of them. One wonders at first why the boats are of such strange models, but when you observe a six or eight-mile tidal current combined with weather conditions not duplicated on our coast, they are easier to account for.

Centuries have developed boats to meet these conditions. You would enjoy seeing the dyed sail fishing luggers at work. They carry a large spread of sail and go along as comfortably as you please in a sea and wind that would down most of our small fishing boats.

The 110's are well thought of. They behaved splendidly coming across, are very strongly built and good sea-boats, but not fast enough. Their tests proved that they could live and travel in a sea which would incapacitate the type of patrol boat so largely built for our work at home. We brought over several gas-boats for base use and they are very much overengined; 15 miles per hour is plenty fast enough for despatch and guard-boat work, and more speed is only a handicap in a crowded harbor. These boats are also too lightly built, as the landings are crowded and the harbor rough, so it is only a question of time before they are knocked out. Then the crews aren't overexpert and it takes a gas engineer to keep the big six-cylinder plants running.

After the war is over power yachts will be much better built, more seaworthy and have simpler machinery plants. A lot of yachtsmen are going to become seamen. It is a great pity that none of our designers are here (as far as I know). The way to learn about what is wanted is to go to sea and see the conditions the vessels have to meet.

The Diesel engine is very well thought of here. Have seen any number of large vessels so equipped since leaving the United States. The French consider anything else entirely out of date. My own idea was turning to a simple steam plant, but have seen so many good Diesel plants that I am turning to them; all four-stroke type.

Speaking of steam—there is nothing in having an evaporator in a small boat—better to carry the water itself than the coal and machinery to freshen it. The ice machines too cause a lot of trouble on the yachts.

The charts of this coast are very interesting. There is no compass rose on the French charts; they use what they call a repporteur, a transparent protractor, laying the course from the meridians. This seems a good way when you get used to it. The charts do not compare with our own in detail and information, fortunately for me, perhaps, as I have to translate all the wording before it is much use to me. THE RUDDER comes as regularly as the mails will permit and like everything else that reminds us of home, is always welcome.

On the French Coast, Oct., 1917. N. R.

Fire Preventatives

Editor of THE RUDDER:

That article in your November issue on "Fire", by Mr. Starr, is excellent, and cannot be read too carefully by power-boat owners. There are, however, two points in regard to which I would like to make suggestions.

The protection from back-fires afforded by wire gauze depends on surrounding conditions. The reason flame, under ordinary conditions, does not pass through fine gauze is because the gauze conducts the heat away, and dissipates it, so fast that the temperature transmitted through the gauze is not sufficient to ignite gas on the other side. If, however, the gauze is so located that it is subjected to continuous high temperature it is not able to dissipate the heat fast enough, and soon acquires a temperature that will ignite any gas coming in contact with it. A case of this was when an inventor of a new two-cycle engine was troubled by back-firing into the base. Four or five layers of gauze in the transfer passage did not help him, because so much heat was transferred from the cylinder that the gauze could not dissipate it fast enough. (Incidentally, he found a close grid made up of a number of strips of thin sheet steel worked much better.)

The second point is in regard to carbon tetra-chloride. When inhaled in sufficient quantities this is a dangerous poison. Therefore, when this material has been used below decks, or in any enclosed compartment, no one should remain in it longer than absolutely necessary, until it has been aired out thoroughly. If the fire makes a long fight, several people should take turns with the extinguisher at short intervals, so that no one person will get too great a dose of the gases.

New York. TECHNICUS.

Sea Mew a Fine Boat

Editor of THE RUDDER:

I am glad to see the great improvement in THE RUDDER and wish it continued success.

With regard to Sea Mew. I built one from plans in the November RUDDER, and can say she is the best boat of her size and type in existence for all-around fun. She stands up to the breeze with full sail when the others begin to take in a reef; in fact, she is the best ever. I used a metal centerboard, also the cat rig.

Canada. J. L. MCKENZIE.

Owner—Designer—Builder

Editor of THE RUDDER:

In reply to your communication of August 30, 1917, with which you forwarded a copy of your editorial, "Owner—Designer—Builder", and requested comment thereon, allow me to express my thanks for your having brought this article to my attention, as I have found it full of interest and suggestion.

It has been the privilege of the writer to be closely associated with the design of all the principal vessels, including the 110-foot submarine chasers referred to in your article, which have been brought out by the Navy Department during the past few years, and during this period the writer has been in contact with many of the prominent designers and builders of vessels large and small, both in and outside the Government, and has endeavored to obtain the standpoint of each, so far as practicable, as relating to the problem of ship design.

Confining comment, then, to the first two divisions of your above editorial, the writer desires to emphasize particularly the necessity of an exact statement of the requirements which the design must meet. It would appear that the objectionable types referred to have in practically all cases been the result of either the undue emphasis of some one requirement or the blind following of a fad. A careful outline of the requirements to be met and a consideration of each requirement in turn in the light of all the others, with a determination to eliminate features for which no definite reason exists, will go far toward the obtaining of that compromise in design which alone can insure satisfaction. Inasmuch as it is hardly to be expected that the average owner will be in a position to lay down such a set of requirements as that just referred to, it is suggested that the designer himself prepare the same for submission to the owner in order that a satisfactory basis may be provided upon which to commence the building up of a design. Such a custom will be found conducive to the systematic handling and recording of design data, which is daily becoming of greater importance.

Having definitely established the characteristics, the writer would suggest the selection of suitable displacement, dimensions and underbody coefficients as the next step, especial care being given the determining of the beam and prismatic coefficient, inasmuch as the stability, period of roll, and the vessel's safety as well as the comfort of her personnel are directly affected by the value assigned to the beam, while the power and fuel consumption are vitally associated with the prismatic coefficient. Attention is especially invited to the fact that the foregoing does not imply the mere use of good judgment in deciding upon the dimensions and form. This is always assumed. The selection referred to is based upon the speed, radius, seagoing qualities, and cost requirements as governed by powering formulæ or methods based on actual experiment, stability data theoretically correct and properly arranged, laws covering underwater form characteristics, and systematically kept cost records. It will then be possible to proceed with the development of the lines, general arrangement, and other characteristics, in the usual manner, except that the methods just referred to eliminate all uncertainty which might otherwise exist as to the suitability of the selections made. Thus no time is lost by unfortunate guesses.

In the opinion of the writer, the preliminary or basic stage of the design is at once the most important and that which is the most often slighted,—probably because of the desire to proceed immediately to the general arrangement and layout of accommodations, etc. It is necessary only to consult tables giving characteristics of vessels actually built and in use to emphasize the great divergence in practice relative to the basic elements of design. It must be admitted that there is room for variation in the selection of these elements in order to satisfactorily meet a given set of characteristics. The writer has found, however, that a careful arrangement and study of the data available will reduce this problem to an almost exact science, so that, given certain conditions to be met, certain quite definite results will very logically and certainly follow.

Such methods as those referred to above have not been in general use until recent years, even in the largest shipbuilding establishments in this country, and would probably be thrown aside by many yacht and pleasure craft designers at the present time as impracticable refinements. Referring to that part of the editorial which discusses the yachtbuilding plant, however, and points out the necessity for introducing modern facilities and methods in order to meet after-the-war conditions, the writer is strongly of the opinion that the same line of argument applies with equal force to the yacht-designing office of the future. Rule-of-thumb methods and rough approximations or guesses will prove too costly to survive the competition of the future, and systematic design based upon scientific principles and careful analysis of results already obtained, must be adopted where high-grade results are expected.

U. S. Navy Department. JAMES L. BATES.

* * *

Editor of THE RUDDER:

I have your letter of the 6th inst., asking for comments on your August editorial regarding Standardization, and perhaps you won't like what I am going to say, but I thoroughly disagree with your comment that it is not feasible to standardize cruisers. If you want to qualify your statement—that it is not feasible to standardize large cruisers or yachts,—I won't disagree with you, because we do not engage in that class of work; but any boat up to 60 feet, in which we do specialize, I know can be standardized to the great advantage of the purchaser of such a boat.

If you won't think me too blunt, I want to say that I believe the development of the power-boat industry has been held back for many years by some of the old fellows in the business thinking that these modern ideas could not be used in the boat business, and this business of standardization is only one of the illustrations of this kind that I have in mind. If you will look around you, you will see that the power-boat industry is being forced into standardizing, and some of the concerns who have fought the hardest against these modern ideas I see are now falling into line and talking keenly about the development of these new features.

I would respectfully point out for your consideration that a standardized boat can attain these points:

First.—The greatest utilization of space.

Second.—That it can be designed to obtain the highest degree of efficiency in a combination of speed, seaworthiness and refined appearance. I make this statement based on experience,—that the highest degree of efficiency cannot be secured in any other way, or at least that the chances of securing it are very small, and it is not until the money has been spent to build a new design and launch and test it that the owner knows for sure whether or not his purchase is a success.

Third.—A good many of the freak and impractical

arrangement plans that have been used in the past have been devised by individual buyers, and are responsible for a good many of these same buyers becoming so dissatisfied with boating that they have given it up, and are responsible for discouraging a good many other possible boat enthusiasts from taking part in this sport. How many times have you seen an engine tucked away in some fool cubby hole, where it was impossible to get at it and work around it, and it would be just human nature that the machine would be neglected and would give unsatisfactory service, and then both the boatbuilder and engine company would be everlastingly cussed at for the unsatisfactory outfit.

I maintain that it is the boatbuilder's fault that he doesn't insist on and obtain all of the essential practical features of arrangement of interior and installation of the machinery and equipment. It is the assumption that the builder should have had the experience to enable him to intelligently dictate how these things should be. You know what has happened to the automobile industry since the manufacturer dictates how he will design his car; and if you will be fair about the matter you will also concede that it is the same tendency that has built the power-boat industry up in the last four or five years and made the sport popular with people who appreciate smart equipages.

Fourth.—I also maintain that it is the patriotic duty of every kind of business in war times to organize their affairs so that their business changes the serenity of the industrial field as little as possible,—in other words, I think that one industry working along haphazard methods should not unnecessarily encroach upon the material and labor markets to the extent of reaching other industries which Uncle Sam is also leaning on for supplies. It is quite evident that standardization greatly simplifies the requirements in materials; it is impossible to convey to anybody the great force which this point means unless you have had the actual experience in doing purchasing under the scheme of special construction and then doing the purchasing under the scheme of standard construction; you will find that it takes away two-thirds of the mental wear and tear and is the kind of saving of energy that Uncle Sam is urging everybody to practice.

Fifth.—It means that the sum total result of all these things is that the buyer obtains at a reasonable cost the aggregate of all the beneficial experiments of the boatbuilder and gets a boat that embodies in the highest degree all the practical features of boat-building, engine construction, equipment and fine layout, smart appearance and safety. Isn't this what the public wants and what is the use of bucking progress?

I hope you will not get provoked at my varying so strenuously from your viewpoint, but you asked and this is what I think.

Albany, N. Y. L. L. TRIPP, *President,*
Albany Boat Corporation.

* * *

Editor of THE RUDDER:

I have always admired THE RUDDER for its constructive work and for its consistent effort, both under the new and the old management, to steer the sentiment of the yachting fraternity toward boats that were boats and that would remain boats for at least a few seasons.

This policy has been a good thing for the sport, but now "the Sport" should take a very minor position, for in its place and in the place of "the Business" and even "the Life" stands, overshadowing all, *THE WAR.*

At the present moment this is the one great concern of the country and the owner, designer and builder of yachts are in positions to be of the greatest service to their country, and the country needs them desperately.

When some of the ablest men in the country are working for the Government at one dollar per year, and when there is a cry along our seaboards for men who can build wooden ships, it is a most selfish and unpatriotic, almost treasonable thing for a yachtsman to employ such men in building for his pleasure. Again, it is as bad to use money in this way as it is to use men. The Government needs the loan of the money as much as it needs the services of the men. Let the man who is planning a new yacht for himself, to be built this Winter, stop and consider how many days' work and feet of lumber he will thereby withhold from the building of ships that must carry supplies to our troops and our allies.

A man who can design wooden yachts can also be of great assistance in the designing and building of wooden cargo boats. Even though the designs may be more or less standard, there is much work to be done besides drawing the lines, as every naval architect knows. A man who has been used to drawing the beautiful and pleasing lines of yachts may detest the drudgery of carrying through the details of construction of a tubby merchantman which someone else has designed, but let him reflect that many a man in the Army detests digging trenches and standing all day with wet feet, frozen toes and such little inconveniences. Let the designer look over his net income for the last year and then go and look for the job where he will be most useful and see how slight will be his loss.

Then the builder! When I come to talk about him that portion of my vocabulary which will pass the censor (and this letter will be censored, you know) is entirely inadequate. For God's sake, build us the ships! Every man who can drive a spike or fair a batten or use a caulking iron, or do any of the hundred and one things which are common to ships and yachts—go to the shipyards. You won't have to go far. They are scattered all up and down both coasts now, and more are coming every week.

You men who are running small yards and boatshops, go and see what these same shipyards will pay for good foremen. You can afford to shut up your little shops for the wages you will get, and I know that a bunch of you lost money last year anyway. If your yard is of some size but not big enough for cargo steamers, see what prices are being paid for coasting schooners which take the place of the coastwise steamers that have been put into the transatlantic trade.

We who have come into the Navy for the war have seen both sides of the question and know some of the requirements of this war which we have undertaken, and also some of the facilities and men along the coast which could help and don't.

I hope I have made clear my idea of what Owner, Builder and Designer should do for themselves and their country and their sport. Build us the ships! Shorten the war and save the lives of your friends who are in the Army, and don't forget that some of us who are in the Navy will go on these same ships with the gun crews that will sink the U-Boats IF—and only if we get the ships.

U. S. S. Georgia. R. W. ROSE, *Ensign,*
National Naval Volunteers.

THE RUDDER

[Title Registered U. S. Pat. Office]

Published on the Twenty-Fourth of the Month

BY

THE RUDDER PUBLISHING COMPANY

254 West 34th Street, New York, U. S. A.

To whom all communications should be addressed

Down Town Sales Office

9 MURRAY ST., NEW YORK

Arthur F. Aldridge, President
Andrew Paterson, Vice-President and Business Manager
James R. Thomson, Treasurer
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Entered at New York Post Office as Second-Class Matter

SUBSCRIPTION RATES

One Year	$2.00
Six Months	1.00
Single Copy	.25

The Tonnage Muddle

This world would be a much better place for all of us today if there was on the part of all governments a more general observance of some of the familiar texts of Scripture, but it must be admitted that there is one at least which is observed alike by empires, monarchies, republics and democracies:—"Let not thy left hand know what thy right hand doeth." Under all governments and at all times and places it seems to be an essential concomitant of bureaucracy that this text shall be interpreted as an injunction for the prohibition of all rational and sensible coordination of members. Only recently the necessity for coordination and cooperation was emphasized by Secretary Redfield, of the Department of Commerce and Navigation: "There is no danger if we pull together, the only danger is in dissension among ourselves"; and yet we find in the new war-tax legislation that conflict of departments which is as bad in its results as actual dissension.

The new war revenue act was passed by Congress, its administration being committed to the Internal Revenue Service of the Treasury Department. It imposes a tax upon "Yachts, pleasure boats, power boats, motor boats with fixed engines, and sailing boats of *over five tons net.*" Prior to 1906 papers were issued to pleasure vessels of five tons, and the majority of such yachts were entered at their respective customs houses, measured for tonnage, and this tonnage, with the official number, was carved on the main beam. In 1906 an order was issued by the Bureau of Navigation prohibiting the documenting of pleasure vessels of *under* 16 *gross tons,* and all existing papers were withdrawn; no new ones being issued except to yachts on fresh water and to a few, for some reason which is not apparent, upon salt water. Practically all tonnage measurement was abolished for yachts of under 16 gross tons.

It would seem that this long-established practice of the Department in special charge of this detail was not known to the legislators who framed the war revenue bill. As the matter now stands yachtsmen throughout the country are trying to ascertain the tonnage of their yachts; where a yacht appears to be near the limit of five tons it will be necessary to have her officially measured by the Customs officers. Apart from the unnecessary annoyance which this uncertainty has caused, in the case of all yachts not obviously above or below the limit, there will be a tedious and superfluous job for some official; presumably at the expense of the owner. It would have been a simple matter to establish some formula based on the external dimensions of a yacht, easily applicable by the owner, which would have approximated the limit of five tons.

America

The junking of staunch, seaworthy and serviceable sailing yachts, some with auxiliary power, began prior to the breaking out of the war, but within the past six months it has progressed so rapidly that it is still a question where it will stop. The sale for the mere value of her lead of a modern cruising yacht of large size and moderate type with a new and powerful engine is a serious menace to the future of yachting, but none of the various inroads of this kind on the yacht fleet has aroused such feeling as greeted the recent advertisement of the world-famous America. The notable absence of all demand for modern schooners of the same general size and type limited the market to two classes of purchasers—the few who might be animated by a sentiment of patriotic devotion to American yachting and the many who would value her as merely so many tons of lead plus a hull that might be made over into a commercial drudge. It has been the fate of many a fine yacht, notably the schooner Resolute, the Cup defender Puritan, and now the good old Sea Fox, to end their days in carrying Portuguese immigrants from the Azores to New Bedford, and at one time it looked as though America would share this same lot. Since the death of the late General B. F. Butler the yacht has been owned by his son, Paul Butler, and his grandson, Butler Ames; Mr. Butler, though well to the front in the seniority list of the Boston Y. C., has been better known as a canoeist than as a yachtsman and, like Mr. Ames, has led a busy life; neither giving much attention to yachting. For the greater part of the past twenty-five years the yacht has been moored near one of the bridges in the city of Boston, being seldom seen in commission, and it has only been a question of time before the inevitable must come.

It is greatly to the credit of the town which, in another emergency some thirty years ago, produced the "Boston Bean-pot", that at the present time, and under war conditions, she has again come to the front in an action that is both patriotic and altruistic. The old America is now in the hands of a syndicate of Boston yachtsmen, members of the Eastern Y. C., which will preserve her as long as possible, just as "Old Ironsides" is preserved by the Navy Department, as a reminder of the greatest event in the history of yachting.

"Where did she come from? New York town.
Who was her skipper? Old Dick Brown."

Gratifying as it must be to all American yachtsmen to know that the old boat will end her days in honor befitting her career, not a few will feel that New York and not Boston should be the guardian of such a prize. It was to New York, and New York alone, that the building and the victory of America were due; the six members of the first great yacht syndicate were not

merely New Yorkers but the founders of the then infant New York Y. C.; her designer, though not born in the city, came there as a child and contributed in no small degree to its fame as the birthplace of the greatest ships of the time; in model she was only a refinement of the New York pilot-boat, then famous abroad as well as at home, and in build she was the product of that wooden ship-building for which New York was famous in every port of the globe.

In a similar but less important matter a dozen years ago the esprit-de-corps of the New York Y. C. asserted itself, first in individual action, backed later by the club. The first house of the club, the quaint old chapel-like structure at Weehawken, was threatened with destruction, having long outlived its usefulness; through the efforts of the then-commodore Frederick G. Bourne it was secured from the railroad which owned it, floated to the club station at Glen Cove, and restored in a way that ensures its preservation. The proper and fitting place for America to end her days is obviously beside this clubhouse, where she might fly for many years to come the flag under which she was launched sixty-six years ago.

War and Pleasure

There is so much of absorbing interest in Ambassador Gerard's book, "My Four Years in Germany," that even the careful reader may overlook the almost casual mention which is made of a subject of the first importance. In the opening of Chapter VI Mr. Gerard says: "When the Germans decided to build up a great fleet, the Emperor used every means to encourage a love of yachting and of the sea, and endeavored to make the Kiel week a rival of the week at Cowes, the British yachting center. With this end in view, the rich Germans were encouraged and almost commanded to build and race yachts; and Americans and others who visited Kiel in their yachts were entertained by the Emperor in an intimacy impossible if they had come to Berlin merely as tourists residing in a hotel."

The conditions existing in Germany forty years ago could hardly have been more unfavorable so far as all maritime enterprises were concerned; with a limited seacoast and few good harbors, there were no large inland waters, commerce was limited to a few ports in one corner of the empire; there was next to no navy, no yachting, and the great body of the people had no knowledge of and no interest in the sea. So far as yachting was concerned, it was limited to a few small craft sailed on miniature inland lakes, one of the most popular types being the New York Bay skimming dish, built by Captain Bob Fish at Bayonne, N. J., and known to the Germans as the "bubfish" boat; just as the same craft, imported into England in the little Una, took its generic name from her—the Una-boat.

In that attempt in which he has succeeded only too well, to build up an imperial navy for the double purposes of war and commerce, the young Emperor was quick to appreciate the value of sport as an incentive, and for the greater part of his reign he has made it a definite policy of the government to foster yachting. In 1890 he purchased the Cup challenger Thistle, renaming her Meteor; later he purchased the American schooner Yampa; still later new Meteors were built for him on the Clyde and in New York, and he has owned and raced smaller yachts. His brother, Prince Henry, has been an active yachtsman, and many prominent Germans have taken up the sport. The country that was once content to import 16-foot catboats and buy second-hand yachts of any nationality has of late years turned out schooners of the largest size that can hold their own with the best of other nations.

The results of this policy are plainly visible today; how much of it came from an abstract love of water-sport and how much from a deliberate and calculating scheme of world conquest by peace and war, is a question not worth discussing. The main point is that while the conditions of the German Empire and the United States were to a casual glance radically different, they really had much in common. With a vast coast-line, a great commercial navy prior to the Civil War and always a Navy, and with all of its extensive interests in commerce and fishing, the United States had been handicapped for many years by the preoccupation of its inland population in other pursuits, and by the ignorance and indifference of this population in all maritime affairs, exemplified alike by the general public and its representatives in Congress. The question suggests itself, "What has this country ever done for the encouragement of yachting?" but there is a far broader view of the matter: "Where would America stand today if its maritime interests were understood and appreciated by the great body of its citizens, and not merely by the few within the range of hostile guns along its coasts?"

Loss of Alcedo

The first American yacht to be sacrificed in the war was the steam yacht Alcedo, owned by G. W. C. Drexel, of Philadelphia, sunk by a German submarine somewhere in the war zone on November 5th, one officer and twenty men being lost. The Alcedo was originally the Veglia, one of the great Watson steam yachts, built by the Hendersons in 1895 for Baron Nathaniel de Rothschild, of Vienna. Of nearly 1,000 tons, with a length of 275 feet, a breadth of 31 feet and a draught of 17 feet, she was similar to the Watson yachts Varuna, Mayflower, Nahma and Margarita, built a little later for American yachtsmen. She was purchased by Mr. Drexel in 1905 and renamed Alcedo; the original Alcedo, designed by Chesebrough and built in 1897 by the Harlan & Hollingsworth Company, being renamed Atreus. This latter yacht was sold in 1912 to Mr. E. C. Benedict, of New York, who renamed her Oneida, his former yacht of that name, originally the Utowana, built in 1883, being renamed Adelante. The Oneida, the first Alcedo, is also in Government service.

The British Trawler

With the eyes of the world focused on novel craft of extreme speed, torpedo-boat destroyers, submarine chasers and hydro-aeroplanes, but little attention is given to the homely, unpretentious craft illustrated in this issue —the British trawler. Of recent years these small steamers, staunch, sturdy and with thoroughly reliable power, have driven out the old sailing fishermen of the North Sea and other waters about the British Isles. At the outbreak of the war there were probably from four to five thousand of them, and manned by men who had grown up in them from boyhood; a large part of this fleet was at once mobilized for a coast patrol, and the service which it has done cannot be estimated at the

present time. It is to be hoped that for the direct value of the lesson, apart from all considerations of justice and historical record, the work of the trawler fleet will be made public after the war.

Though not standardized, the construction of the trawler has been so simplified, the vessels being turned out almost as stock boats in many of the small English yards, that they may be built quickly and cheaply; a fleet of trawlers capable of keeping the sea indefinitely under the worst conditions, and of a sustained service speed at sea, can be built for the cost of one "converted" yacht, which will never realize as a war auxiliary a fraction of her reputed speed as a yacht, and which is likely to come limping into port just when she is most needed.

Anfindsen's Altitude Tables

Captain S. Anfindsen, a well-known navigator, has given navigators a very valuable work in his "Altitude Correction Tables". The Tables, while well known and in general use by all navigators on the North Atlantic, are little known elsewhere. For years Captain Anfindsen published the edition in Antwerp, but owing to the invasion the printing plant and all plates were destroyed, and for a time it was impossible to secure a copy at any price. The Captain came to America and realizing the great demand and value of the Tables, arranged with THE RUDDER to print a new edition. The Tables are now ready for distribution and sell for $1 a copy. They are useful for the smallest coaster or largest steamer afloat on any ocean or coast.

* * *

Because of the increased cost of material and expenses, it has been necessary to make a slight increase in the prices of the books which have been reissued by The Rudder Publishing Co. This may seem a hardship to those who buy these books, but it is much harder for THE RUDDER to raise prices that have been kept fixed for years than for those who will have to pay the slight increase.

* * *

The Navy is to be increased shortly by the addition of 80,000 men. A bill to permit this is to be introduced in Congress as soon as it meets. In the meantime men are asked to enlist. The Navy is thoroughly democratic. An enlisted man can, by study and careful work, earn commissioned rank, and it offers many exceptional inducements for advancement to all who join its ranks. THE RUDDER is carrying a stock of Navy books issued by the Naval Institute, which tell all that a man should know to rise in the service. A list of these books, together with others on navigation, seamanship, etc., are to be found in the advertising section of THE RUDDER.

Spokes from the Rudder Wheel

The members of the Columbia Y. C. of Chicago have elected the following officers: Commodore, C. H. Morgan; vice-commodore, H. L. Stratton; rear-commodore, C. O. Walliser; secretary, Louis H. Sebbes; treasurer, M. J. Bates; directors: H. D. Moreland, J. J. Cone, Harry S. Gaither.

* * *

Two of the four 120-foot steel scout patrol boats building at Herreshoffs are completed. These are for former Commodore Robt. E. Tod and Alfred I. Du Pont. Those for Payne Whitney and George Nichols are nearly completed. These vessels are fitted with Herreshoff steam engines and are to make 26 miles an hour.

* * *

Three 80-foot scout patrols are being built at Herreshoffs which are to make 18 knots. Two of these, which are to be driven by Herreshoff steam engines, are for Lieutenant Richard Russell, of Boston, and Lieutenant Winthrop Aldrich, Jr., a son of the late U. S. Senator Aldrich, of Rhode Island. The third of these boats is for Hallowell Morgan, of Philadelphia, and will be driven by two Duesenberg engines of 400 h.p. each.

* * *

Sir Thomas Lipton recently cabled an offer to purchase the schooner America. He explained that he did so to keep it from being junked, and if he had made the purchase would have presented it to the country to be kept as a relic. When he heard that the yacht had been taken by several members of the Eastern Y. C., he withdrew his offer.

* * *

A 26-30-h.p. Standard engine is to be installed in the yawl Dorello II, owned by George Batchelder, of Boston. The yacht is now at the yard of Tuthill & Thorne at Greenport, L. I.

Captain Nat. Herreshoff, who is now in better health that he has been for many years, has gone South, taking a well-earned rest.

* * *

The Standard Motor Construction Company has published a most complete book on the engines used in the 110-foot U. S. submarine chasers. It is the most complete book of its kind published and is issued through the Bureau of Steam Engineering. Leonard B. Brown is the author and the book, which is illustrated very fully with diagrams, carefully explains the Standard engine and tells how it should be operated and cared for. Eugene A. Riotte, President of the Standard Construction Company, has written the foreword. The Standard engine is doing wonderful work both in the British 80-footers, the Italian chasers, and the U. S. 110-footers.

* * *

The members of the Sag Harbor Y. C. have elected the following officers: Commodore, William S. Eaton; vice-commodore, J. Richard Taylor; rear-commodore, Charles D. Napier; secretary-treasurer, E. P. Eaton.

* * *

Daniel Guggenheim's new 86-foot power boat Firenzi, built by the Gas Engine & Power Company, from designs by William Gardner, has attracted much attention at this end of the Sound. She runs with the regularity of a ferryboat between Mr. Guggenheim's country home and the city twice each day and makes fast time.

* * *

The St. Georges Y. C., the oldest in Bermuda, has elected the following officers: Commodore, Dr. Percy Graham-Shelley; vice-commodore, W. E. Meyer; rear-commodore, E. Outerbridge; secretary-treasurer, W. P. Mayne. The club is planning to hold a race for THE RUDDER Cup shortly.



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Designing of Marine Gas Engines

By Chas. Desmond

PART II

BEFORE beginning my explanation of engine designing I will briefly explain the meaning of some of the terms that will be used in these articles.

The Meaning of the Term Work.—When a force moves a body upon which it acts it is said to do work upon that body. Work signifies overcoming resistance. Unless the resistance is overcome no work is done; because work is always measured by the *effect produced,* not by the effort put forth, and is the product of force multiplied by the distance through which it acts. Therefore, work is always expressed in measures of both *Weight* and *Distance.*

Thus, if one pound is moved through a distance of one foot, a *foot-pound of work* is done.

In computing work no account is taken of *time* required to accomplish it. But since time required to perform work is of importance the rate of work is a factor that must be considered when dealing with machines. Thus, if one machine can do a certain amount of work in one-half the time required by another it is correctly said to have twice the power, therefore, the power of any machine is the *rate at which it can do work.* So when expressing power of machines the factor of *time* must be taken into consideration.

The Meaning of the Term Horsepower, Indicated Horsepower and Brake Horsepower.—In expressing the power of engines the unit used is called a horsepower, or the supposed ability of a horse to do work.

One horsepower is considered as being 33,000 foot-pounds of work performed in one minute of time, or its equivalent. Thus a force of one pound acting through 33,000 feet in one minute, or 33,000 lb acting through one foot in one minute, or 50 lb acting through 11 feet in one second will all equal one horsepower (written h.p.). Force, distance and period of time enter into all h.p. calculations. In calculating the power of an engine the unit of time used is *one minute,* the distance unit is the number of *revolutions* made by the crank shaft in that period of time, and the unit of force used is the pressure exerted on the moving piston; this pressure being calculated for the full stroke and averaged.

This being the case, it is evident that while a h.p. is a definite amount, the power of an engine will vary with every change in number of revolutions, length of stroke, or pressure exerted on piston. So before the power of any engine can be calculated the diameter of cylinder, the length of stroke, the number of revolutions and the pressure of steam (if engine uses steam) or the compression (if engine is an internal-combustion one) must be known; then by using the figures and making the proper calculation the power exerted in that engine's cylinder at the named number of revolutions and with the named pressure on piston is ascertained. This power is termed the *indicated horsepower* (written i.h.p.) of the engine, the term being derived from the instrument (indicator) used to draw a diagram showing variations of pressure in cylinder at different portions of stroke; for you must remember that the pressure exerted on the moving piston of an engine by steam, or by the explosion of gas and air will vary, being greatest when piston is at its highest point and lowest when piston is at lowest point. It is this variation of pressure that makes it advisable to use the indicator and necessary to determine the *average* pressure for the whole length of stroke.

The i.h.p. developed in the cylinders of a marine gas engine can be determined by using this formula:

$$1.\quad \frac{P \times L \times A \times C \times E}{33000} = \text{I. H. P.}$$

Where P stands for mean effective pressure in one cylinder*
L stands for length of stroke in feet
A stands for area of head of piston in square inches
C stands for number of cylinders
E for number of explosions in one cylinder per minute.†

To illustrate the application of the i.h.p. formula I will calculate from the data given below the i.h.p. of a marine gas engine.

The mean effective pressure in cylinder is 60 lb.
The length of stroke is 0.5 foot (6 inches).
The area of piston head is 22 square inches.
The number of cylinders is 2.
The number of explosions in one cylinder per minute is 400 (800 revolutions, four-cycle).

$$2.\quad \frac{60 \times 0.5 \times 22 \times 2 \times 400}{33000} = 16 \text{ i.h.p.}$$

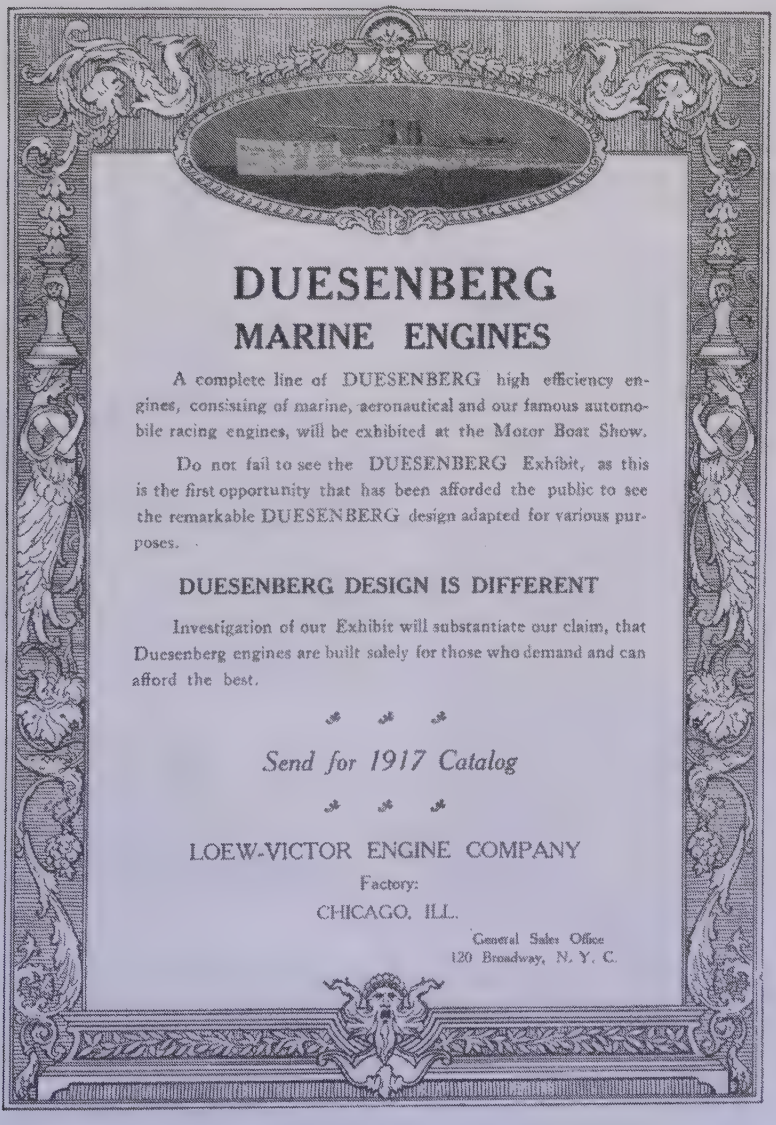
But you must not suppose that *all* of this power is available for use, for while the i.h.p. of an engine is an accurate measure of the power developed *inside* its cylinders, it does not give any indication of the *actual* power engine is capable of delivering at the end of its rotating crank shaft. The i.h.p. of a marine gas engine is in reality an expression of the theoretical power the engine is capable of developing and as in i.h.p. calculations no

*The mean effective pressure is determined by using an indicator and making the proper calculations, or it can be calculated by using a formula which I will explain at the proper time.

†In determining h.p. of a gas engine it is necessary to count the explosions. In this illustration the engine is a four-cycle, running at 800 revolutions a minute.

Carefully read the portions of my article on Power-boat designing, in this and following issues of The Rudder, explaining measurement of surfaces and volumes, calculating C.G. points and determining inertia. It is very necessary to have a clear understanding of the fundamental rules covering these things.

(Continued on page 20)


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(Continued from page 18)

piston to close exhaust opening before the new charge of gas and air can reach it. You must keep in mind the fact that the flywheel attached to end of crank shaft, through its momentum, carries the crank shaft and piston past the dead-center and upwards until the highest point is reached and piston can again be acted upon by a new impulse.

The up movement of piston closes intake and exhaust ports and the gas and air that is now above piston is compressed, and in addition to this, as the piston moves up a vacuum is created in base and a new charge of gas and air is drawn from the mixing device, through a suitable opening, into the base. Just before piston reaches its highest point the now highly-compressed charge of gas and air in cylinder is ignited (fired) and the cycle of operation is completed.

Methods of keeping the cylinder cool, of mixing the air and gas, of admitting the mixed gas and air into base and into cylinder, and of exhausting the burnt gases may, and do, vary considerably in different engines; but no matter how great a variation there is in these, the operations of the cycle *must* follow in proper order and *must* be completed in one *down* and one *up* movement of piston. As the operation of a two-cycle marine engine requires the simultaneous introduction of a *new charge* and *exhausting* the burnt gases, efficiency and economy depend largely upon the speed with which the gases can be moved, and in keeping them separated during this operation.

The Operation of Four-Cycle Marine Gas Engines

In each cylinder of a single-acting reciprocating four-cycle marine engine, only one impulse is given to the piston in each four movements (two down and two up); it is therefore necessary to so arrange the moving parts that the momentum imparted to flywheel of engine will be sufficient to continue the movement of crank and piston during the three movements in which impulses are not imparted, and in addition to this suitable arrangements must be made for admitting the new charge of gas and air only during every *second* down movement of piston, and for exhausting the burnt gases only during every *second* up movement. So it is evident that mechanically a four-cycle engine is more complicated than a two-cycle. On the accompanying illustrations, Figs. 3, 4 and 5, I show cross section views of a marine gas engine having mechanically operated intake and exhaust valves, and I have marked the principal parts for identification.

As you will more clearly understand my explanation of the operation of such an engine if you have a knowledge of the uses of the various parts I will, before I explain the operation of engine, briefly describe the parts that are marked for identification.

The use of cylinder, piston, crank shaft and flywheel has already been described (see two-cycle), but as in a four-cycle engine it is necessary to exhaust the gases of old charge only during each *second* up movement of piston, and to admit a new charge of gas and air only during each *second* down movement, some means, other than the direct movement of piston, must be used for regulating the exhausting of the old and admission of new gases. The means most generally used is to add to the crank shaft a gear that will turn with shaft, and to mesh this gear into a larger one that will revolve *once* to every *two* revolutions of the crank shaft. Now it stands to reason that such an arrangement will cause any shaft that is attached to the larger gear to revolve at one-half the speed of crank shaft and if, as is the case, independent valves to close the exhaust and intake passageways are provided and these valves are operated by means of springs and suitably arranged cams fastened to the half-speed shaft, it is evident that each valve will open and close once during each two revolutions of the crank, and this opening and closing movement can be arranged to take place, by setting the cams, at any desired period of every *two* revolutions of crank.

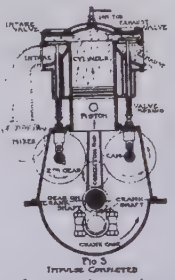
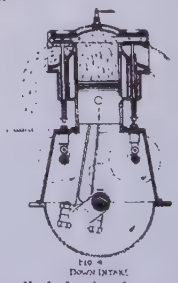


Fig 3
Impulse Completed

Fig. 3 shows a four-cycle engine with its piston at lowest point after an *impulse* stroke.

When piston is at (about) this position, the mechanically-operated exhaust valve begins to open and remains open while piston is moving *up* to its highest point. This up movement is called the *exhaust* stroke, because during it the burnt gases are forced out through the open exhaust valve by the up movement of piston. When the piston reaches its highest point the burnt gases have (nearly) all been driven out and, at about this time, the exhaust valve closes and inlet valve begins to open; and as the piston descends the suction its movement produces in cylinder draws a new charge of gas and air from the mixing device through open intake valve into cylinder. Fig. 4 shows intake valve open and down stroke one-quarter completed.


Fig 4
Down Intake

This stroke is called the intake stroke and when it is completed piston is down, cylinder is filled with a new charge of gas and air and intake valve is closed.

The piston now ascends with *both valves* closed and the charge of gas and air in cylinder is compressed.

Fig. 5 shows up compression stroke one-quarter completed, both valves being closed.

When piston has reached its highest point on this stroke the highly-compressed mixture in cylinder is ignited and the resulting expansion of the burning gases

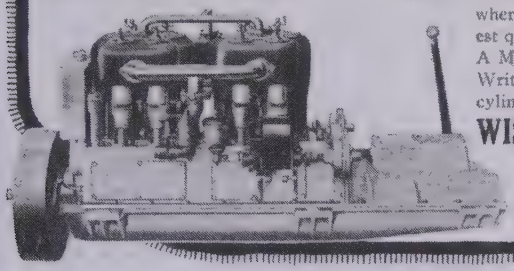
(Continued on page 22)

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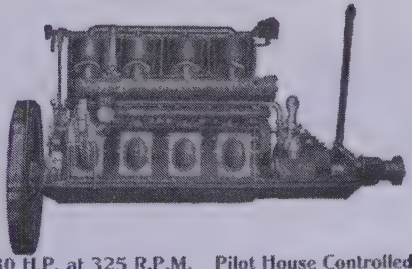
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B.t.u. converted into energy $2545 \times 13.93 = 35451.85$

B.t.u. in fuel delivered to engine $20000 \times 7 = 140000$

Therefore, the thermal efficiency of the engine is

$$5. \quad \frac{34688.35}{140000} = 25.32\%$$

Or in other words, about 75% of the heat units in fuel were not converted into mechanical energy. What has become of this lost energy? For bear in mind this is a fair average illustration of the thermal efficiency of marine internal-combustion engines that use gasolene for fuel.

Some of the heat energy has, of course, been used up in overcoming the frictional and other losses mentioned in my explanation of b.h.p., but as the heat units utilized in overcoming these losses only total about 9%, there remains about 66% to be accounted for.

This unaccounted for 66% is utilized in this manner:

About 36% is lost in the exhaust heated gases.

About 30% is utilized, and lost, in cooling engine.

Therefore it can be said that the percentages for an average marine gasolene engine are

Heat units converted into useful work	25%
Heat units utilized in overcoming frictional losses	9%
Heat units lost in exhaust gases	36%
Heat units lost in cooling water	30%

In the fuel supplied to the average marine gasolene engine there is sufficient heat energy, if expressed in h.p. per hour terms, to develop *four* times the power that is today actually converted into useful work.

Under ordinary conditions of service the mechanical and thermal efficiency of an average marine gasolene engine is

Mechanical efficiency between	80% and 90%
Thermal efficiency between	20% and 30%

Therefore, it is evident that to usefully utilize more of the heat units in the fuel should be the aim of every designer of internal-combustion engines. The percentages given above indicate that the possibility of gain in mechanical efficiency is very small indeed but there is a very great possibility of gain along thermal efficiency lines.

The Diesel engine is an illustration of this. Mechanically it is no more efficient than other engines, and in fact, it is in many instances less efficient mechanically than engines using lower compression, but owing to the fact that engines of the Diesel type are able to convert more of the heat units in fuel into mechanical energy they are rapidly replacing older and less efficient types.

The thermal efficiency of the average Diesel engine lies between 36 and 45%.

I will next explain some of the fundamental principles of operation of marine gas engines.

The modern marine gas engine is an internal-combustion engine operated by introducing a properly proportioned and mixed charge of air and gasolene or other hydro-carbon vapor into a closed cylinder and there compressing and igniting it. The engines are what is known as *compression* gas engines and the cycle of operations in all such engines is as follows:

1st.—The air and gas must be introduced into the cylinder and compressed;

2d.—The compressed and highly explosive air and gas must be ignited;

3d.—The burning gas must be allowed to expand;

4th.—The burnt, and useless, gases must be expelled.

This cycle of operations is performed in the cylinder, hence the term *internal-combustion engine* is sometimes used to designate a gas engine.

Before proceeding further I want to make sure that you clearly understand the meaning of the term *cycle* when applied to a gas engine. A *cycle* is an interval of time in which a certain succession of events is completed, and then returns again and again in the same order. Or another excellent definition is a periodical space of time marked by the recurrence of something, as the cycle of the seasons.

Thus operations mentioned above when they occur again and again in the same order is a cycle of operations. Therefore, when applied to gas engines, the term *cycle* means the four operations mentioned, and no matter what the fuel is, or the number of cylinders used, or the number of revolutions required to complete the operations the term *cycle* only refers to the cycle of operations.

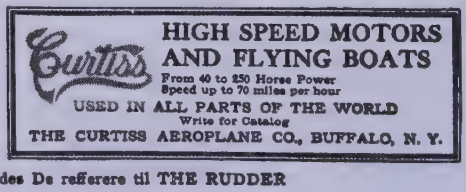
It is usual to add to the term an expression to designate the number of movements of piston required to complete one cycle of operations. Thus the expression two-cycle or two-stroke means that the cycle of operations mentioned is completed in two movements (one up and one down) of piston; and the expression four-cycle or four-stroke, means that the cycle of operations is completed in four movements (two up and two down) of piston. From this explanation you will readily understand that the word *stroke* has been dropped from the expression.

The correct expressions to use are *two-stroke-cycle* and *four-stroke-cycle*.

In the next issue I will explain how the cycle of operations is performed in a modern single-acting reciprocating gas engine.

(*To be Continued*)



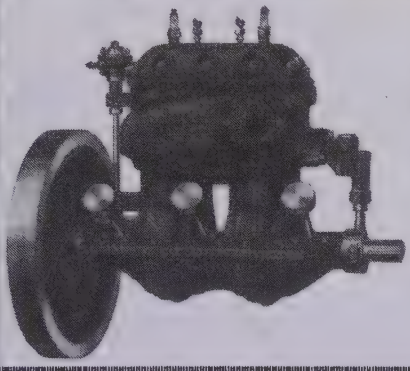


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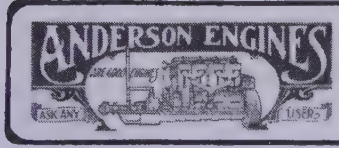
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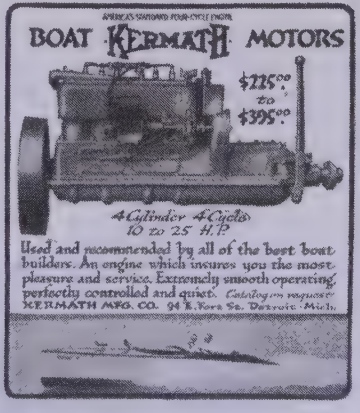
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Koukokusha ni otegami onsashidashi no saiwa dozo RUDDER nite goran no mune onkakisoe negaimasu

(Continued from page 22)

number of cylinders. In four-cylinder engines the variation is not so great, and in six-cylinder the difference is hardly noticeable.

So, sum the whole question of two vs. four-cycle engine up, these things are evident:

That the four-cycle has the advantage in economy of fuel.

That the two-cycle has the advantage in cost of construction.

That, if weight of engine alone is considered, the two-cycle has the advantage; but if fuel weight per unit is considered as a part of the engine weight, the difference is hardly noticeable.

That simplicity of operation is in favor of the two-cycle, providing little or no attention is given to keeping base tight; but if greatest efficiency is desired there is little to choose between the types.

That so far as vibration is concerned the one, two and three-cylinder two-cycle engine is better than the four-cycle, but there is little to choose between four and six-cylinder engines of both types.

That for ease in starting and for range of speed changes, the four-cycle is much superior to the two.

Having briefly outlined the principles of the cycle of operation of marine gas engines, I will now begin to instruct you in the art of designing marine gas engines of the smaller sizes.

The Meaning of the Term Designing

Designing is originating. The designer is an originator, and while he very often has to make use of ideas originated by other designers, he must never be a copier. It is permissible for a designer to make use of all data that is published, but this use should always be confined to *use as an aid* and not as a *substitute* for knowledge. No one can design an engine, or anything, until he is able to formulate an original idea and picture it in his mind.

First should come the *idea*, next comes the working out of details and placing the idea on paper, and last of all comes the proving of the idea and the correctness of details.

The calculations are merely for the purpose of *proving* the accuracy of the designing idea; they are the least of designing.

When you attempt to produce a design, start out with an idea that you can call your own, and try your best to make every design you prepare your own in *spirit* and in *fact*.

Anyone having a little knowledge of mechanical drawing and gas engines can copy a successful engine and by changing the shape of a few parts so alter appearance that the copy may pass as an original design; but that is not designing; it is merely copying, and as such lacks the spirit and life of designing, which is *origination*.

Having formulated your idea you must express it in such a manner that others can clearly understand your intentions regarding form, mechanical details and construction.

The accepted and standard manner of doing this is to set everything down on paper in the form of pictures, called drawings, and written explanations, called specifications. For doing this certain clearly defined rules have been laid down and my advice is always to prepare both drawings and specifications in accordance with these rules. The rules are not difficult to master and cover these things:

The use of certain conventional lines for the different lines shown on drawings, the use of a different arrangement of cross lines (called sectionings) to designate each kind of metal, the showing of such details as threads, tapped holes, finished surface, etc., in certain standardized ways, and the showing of the various shapes of the pieces in a certain manner; for you must bear in mind that the majority of mechanical drawings are what is termed *projection* views, or views on which every part and detail is shown on a plane surface. On drawings of this kind two or more views of each part must be shown.

In a series of articles like this it is not possible to give a sufficiently detailed explanation of drafting rules to be of value to the reader, so I will say to all who do not have a knowledge of the rules, and desire to acquire it, that the best thing to do is to obtain a copy of a good book on mechanical drawing and study it. Some very excellent books on mechanical drawing can be obtained from The Rudder Book Department.

In addition to this, I will say that all construction and design drawings used to illustrate this series of articles will be correctly prepared in accordance with the accepted standards, so if you will carefully study the illustrations you will learn how each detail is shown on projection mechanical drawings.

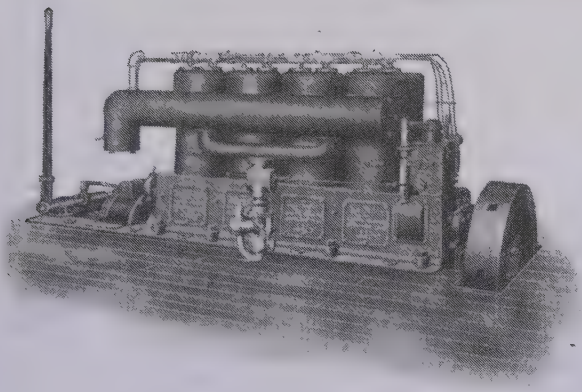
In my next article I will explain actual designing work and calculations, and begin to design an engine.

(To be Continued)



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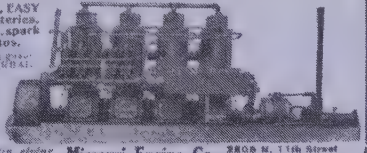
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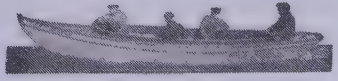
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Quarter-Deck Talk

REDIRECTING EFFORT.

A LARGE majority of manufacturers and those engaged in industrial pursuits, need not be told that desired success in their various enterprises usually fails as a direct result of misdirected effort, or to call it by a more ugly name—inefficiency.

In such cases failure may be turned to success only by redirecting effort, which is nothing more nor less than the installation, and following out to the letter, of constructive reforms in organization, and in executive and production methods.

In order to secure best results it is generally recognized that the starting point towards success is a constructive, rational office and shop organization, where each and every employee, productive and non-productive, is responsible to but one man higher in authority, that the general manager, if the one in supreme command be so styled, may reach the humblest worker only through his own immediate under executive, be he works manager or superintendent, who in turn may communicate through a department manager (or possibly foreman in his absence), to the producing workman or helper.

No employee in any well organized industrial establishment should be permitted to go over the head of either an inferior or superior in command, except with the full knowledge of such inferior or superior. When such an arrangement can be effected, and the rule is promulgated and religiously enforced, the longest stride has been taken towards a redirection of effort.

There are many general managers, presidents and managing directors, who would like to institute efficiency reforms, but who balk at this essential requirement, and as a result, most of the failures to profit from efficiency undertakings are directly caused by unwillingness properly to place responsibilities upon those who may be called upon by their immediate superiors in authority to render account of their stewardship.

Such a condition as above outlined, which could well be called "one-man power business," no matter how many men employed nor how great the financial standing, when brought into direct competition with a well-organized and co-ordinated concern in the same line, eventually is bound towards ignoble industrial defeat.

Such an organization as will not permit any employee to disclaim any responsibility properly his, is not at all chimerical. Plenty of our American industrial aggregations have such organizations, else they could not succeed. Their very strength lies in the degree of perfection of their organization.

The next step making for success is proper information, instantly available, absolutely accurate, and well arranged for comparison.

Every business-man, be he manufacturer or tradesman, must know what his product actually costs, each element and each manufacturing and assembling operation, storage, transportation, etc. These records become absolutely valueless except they are accurate, which it is the exception to find, due in many cases to juggling of time slips where at least nominal attempts are made to record the time spent in various operations, often "balanced" by foremen or others to prevent showing up some defect or poor judgment, the result of inattention or attempt to experiment at the cost of employer.

He next should know what his product should cost under present economic or manufacturing conditions.

If you, Mr. Manufacturer, have progressed thus far in your attempts to a redirection of effort, have constructed a modern effective organization, have introduced a cost-keeping system especially designed to show actual and also comparative costs, and have become able accurately and understandingly to estimate the time it should take to perform each machining, inspecting, assembling and packing operation, there will be no turning back for you towards misdirected effort.

The prediction is made that your eyes will have become opened to the fact that short runs are prodigiously expensive, that standardized parts are more economical of purchase or manufacture than specials, that design must be made which will permit of least machining and save the cost of expensive tools, jigs and fixtures, that you will cease comparing costs in dollars and cents, when hours and minutes mean so much to you in intensive production, that the time it takes to perform an operation is of much more account than what the mechanic earns per hour and what it actually costs to a fractional part of a cent, that you begin to realize that you are educating your under executives and productive workers that they may earn more for themselves and more for you, that you begin to look to their comfort, see that they use brain more and brawn less, you provide better lighting facilities, clean the shop a bit, remove grease, dirt and cobwebs from the windows, improve the sanitary conditions which most likely hardly are able to pass State inspection, see that the machine tools are kept in proper shape for maximum production, that the small tools are not lost, abused or mislaid, that you have created an interest in your own shop, its organization, its executive and productive departments, and in the men who earn money for you (and themselves), until you are persuaded to consider to what point the cost of your product could be reduced with more modern equipment, perhaps a more up-to-date shop, perhaps the first bright light of success following years of work and worry, possibly hardly even partially successful as a result of misdirected effort.

But please do not think that a new shop and new tools come first, that what your product should cost comes before you know exactly what it does cost, and that a "one-man power" business does not need constructive organization to get it into bankruptcy proceedings.

There are three rules which, with propriety, could be displayed in the office of every executive as a constant reminder of what makes for a 100% keeping of the organization intact—executive preparedness. They are as follows:

The Golden Rule.—Do not unnecessarily nor unreasonably interfere with anyone under you.

The Silver Rule.—Do not go over anyone's head, but be strictly obedient to your immediate superiors, recognizing the authority of none others.

The Iron Rule.—Do not listen to anyone you should not, if you would be fair to everyone else and to yourself



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A boat building organization which is prepared to take on all grades of construction finds it difficult to reach that single standard of work which is *our only standard*.
If our charges are sometimes slightly higher than those of other boat builders it is simply because we mean to build into a boat a quality superior to what most builders would consider necessary.
A critical inspection of a Great Lakes Craft would explain exactly what we mean, for our work must really be seen to be fully appreciated. We would like to send you the splendidly illustrated Picture-Book describing the Fifty-Foot Military Type Express Cruiser (refer to it as Bulletin No. 555-E) or, if you are interested in a smaller boat, Bulletin No. 222-E describes and illustrates the Forty-Foot Military Type Express Cruiser. Both of these boats are stock models, a number of which are always under construction at our plant.

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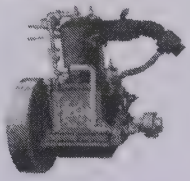
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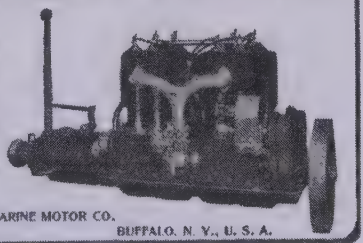


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MARINE HARDWARE AND ACCESSORIES AT THE SHOW

The mezzanine floor at the Grand Central Palace was given over to power-boat accessories. All kinds of marine hardware were there attractively exhibited for the benefit of the yachting fraternity. From the veriest terminal clip to the great gyro ship stabilizer—everything of use or interest to the enthusiast of the ocean wave was to be seen. The displays in the different sections all indicated what strides forward inventive genius has taken during the past year. Many devices that looked crude a twelvemonth ago have now reached a stage of perfection, while other essential mechanical things that we never dreamed of have sprung into existence. Let us walk around and spend a few moments here and there to look over and explain the striking qualities of the manufacturers' wares.

We come first to the American Manganese Bronze Company and find that the feature of their display, of interest to us, is the famous Dyson Propeller. Captain Dyson, designing expert of the United States Navy, has certainly given the marine interests a wheel that is a marvel in simplicity and durability.

The Bosch Magneto Company always puts up a good metropolitan exhibit, but we think this 1917 outlay surpasses anything heretofore. Eight full spaces on the mezzanine floor showed Bosch-equipped Engines of many types and sizes. These units illustrated clearly the various Bosch electrical systems, together with many of the accessories. We found something novel in the Bosch lighting dynamo and the Bosch flywheel drive starting engine, but what especially interested us was the last word in Bosch ignition. Demonstration of each device in operation enabled the onlooker to realize their respective value. To avoid confusion each separate article had a separate stand and we reviewed in turn the Bosch Standard and the Bosch DeLuxe lighting systems and examined the wonderful qualities of each. The Bosch flywheel drive starting engine kept us a while and we moved on to the Bosch Magneto. Demonstrations of the Bosch Waterproof magneto for one to twelve-cylinder models fascinated us and the persistent, even flashes of the little blue sparks kept us spellbound for the moment until we looked deeper. The Bosch certainly possesses magnificent quality, for it is not dependent on batteries and is in itself a marvel of simplicity. The Bosch fills you with confidence because of its reliability which is due to the fact that it is self-contained. Through this independence you get a spark that produces engine efficiency and fuel economy. Bosch magnetos are produced in many types for all kinds of engines so that it is possible to supply a Bosch magneto for any type of internal combustion engine.

The Delco-Light proved the feature of interest in the exhibit of the Domestic Engineering Company, of Dayton, Ohio. The Delco-Light is a complete electric light and power plant in itself. The slogan "So simple a child can operate it," may well be believed when we see the simplicity and safety of the system. The Delco-Light is a compact unit, consisting of a gasolene engine directly connected to a generator, a switchboard and a specially made storage battery. The engine is air-cooled, hence no water or freezing troubles; self-cranking, simply start with switch; only one place to oil. When the batteries are charged to capacity the engine is automatically stopped. Delco-Light is simple—only one adjustment—and rugged—will stand wear and tear in all kinds of weather. Delco-Light should prove invaluable to the suburban or country home for, in addition to carrying a maximum of lighting power, say 50 to 60 lights, one can also utilize the plant for accessory purposes, i. e., run your electric fans, your vacuum cleaner, etc.

We became acquainted with Kokomo, Ind., when we struck Byrne, Kingston & Co.'s exhibit of Kingston carbureters. The secret of the success of the Kingston, apart from the excellence of the manufacture, may be said to lie in its simplicity and compactness. The Kingston has certainly kept pace with advanced ideas in engine construction and change in fuels. Each year has seen an improvement along these lines until it has now become known as "The Standard" for engines to meet various conditions. A good feature of the Kingston lies in the fact that its several component parts are carefully standardized, numbered and listed. Imagine some numskull climbing into your engine room and dropping a sledgehammer on your carbureter—smashing one or more parts. Just haul out your Kingston list, look up the proper number of the damaged part, and your worries are ended, for when you get the part you know it will fit.

The A. S. Campbell Company, of Boston, featured their superior grade of Cello products. First we look over the Cello "Wireless" Searchlight, which is especially constructed without wires to lay around loose and short-circuit. This light is strongly built, very flexible, giving any angle to operate and is especially adapted to power-boat work in showing winding courses, finding mooring buoys, making landing, and so forth. The Cello Wireless Combination Light is similar to their side light but possesses the novel attraction in that the red and green lenses are combined in one light, and built to meet all requirements, adverse weather conditions and all. The Cello brings out another good feature in the Wireless Stern Light combined with flagpole. The poles are of maple or mahogany with the wires running through the pole. The light is socketed on the top of the pole and when the shade is screwed down tight the whole equipment is waterproof and all wires are concealed. The flagpole becomes ornamental as well as doubly serviceable.

Smith & Co. handed us an attractive little folder—The Winners. They have been in the varnish business since 1827, one of the oldest firms in the United States in this line. Their products are guaranteed to be made of pure turpentine and pure linseed oil. Smith's Spar Coating was used on such prominent boats as Resolute, Vanite and Defiance; this fact alone is a testimonial of their very high quality. They make a complete line for certain purposes and their high standard of excellency will be found in all their products.

Smith-Mecker Engineering Company carry a complete line of electrical equipment for all purposes. Their new G-E power-boat searchlight proved of striking interest. This light produces 100,000 candle power and the remarkable efficiency of the reflector permits the use of a small 6-volt, 6-ampere Mazda lamp. Many novel features are incorporated in the design of this project. This searchlight can be had for your own craft, for we find it manufactured in sizes suitable for power skiffs to dreadnaughts.

Chas. D. Durkee & Co. featured the Andrade Automatic Windlass, the Dunn Divinhood and the Eells Stockless Anchor. It is safe to say that this is the best known firm of its kind in the world. They carry a complete assortment of marine hardware, accessories, paints, boatbuilding tools and equipment, all types and kinds of instruments pertaining to navigation, stoves and ranges, marine glues and cements, mops, brooms, anchors, chains, folding chairs and other fittings, ventilators and special equipment. The Andrade Automatic Windlass is endorsed by yachtsmen as the "Windlass that can be depended upon under all conditions." The salient factors in favor of this Windlass are: greater pulling capacity with less weight, every working part in plain view, "makes a one-man boat out of a 60-footer." The Dunn Divinhood will supply a long-felt want. As the name implies, this helmet is to be worn when it is necessary to do the Brodie stunt in order to get a mooring chain out of the propeller, change a wheel, hang a rudder. The Eells Stockless Anchor is the last word in "Anchor Art." This anchor can certainly hold and it is appropriately referred to as "the anchor with the Bull-Dog Grip." Weight for weight this anchor possesses nearly twice the holding power of any other type.

Joe's famous reverse gears were attractively arranged. "The gear that gets there." This is the slogan of Snow & Petrelli's exhibit and it is a deserving one. Joe's gears are used by many of the leading engine companies of the world and may be found in service in many of the large navies of the world, and in the lighthouse and life-saving service.

The Smith-Serrell Company, Inc., featured the Francke flexible Coupling for marine users. This coupling can be had for any size or kind of direct connected machinery or marine engine. The flexible properties of this product supplant the old-style rigid shaft coupling. Misalignment, friction, heating and wear are done away with, much more dependable operation is realized.

The great gyro ship stabilizer exhibit by the Sperry Gyroscope was one of the most interesting phases of the show. This important invention is exhibited by operating different gyros, the smaller suitable for patrol boats and the larger for yachts of about 600 tons. When one figures the weight of the stabilizers as only one per cent of a vessel's tonnage, the value is apparent. Incorporated in the construction of a craft of any size, rolling is reduced to a minimum. The yachtsman can now look forward to a stormy voyage down the coast with comparative calm—knowing that his party will not desert him and make for his or her stateroom. The era of ship

(Continued on page 30)


All Coming to it for 1917
LEECE
ELECTRIC
STARTING-LIGHTING
SYSTEM
NEVILLE
THEY
electric cranking, One-Man
Control
superiority and because the
L
reliable
and highly
builders
have
Leece-Neville
System
equipment, because a power
boat without electric starting and lighting is not completely equipped
THE LEECE-NEVILLE COMPANY
CLEVELAND, OHIO

(Continued from page 28)

stabilization is now here. Stabilization giving even riding will cut down fuel expenditure in a seaway. Preparedness was the keynote of the show, so we were more than interested to know that the gyro is being ordered by our naval vessels. The value of a level gun platform in a storm action at sea is readily apparent. Then Sperry introduces us to the gyro-compass equipment for yachts. This device receives its directive force from the earth's rotation and is not disturbed by natural or foreign magnetic factors—hence its advantage over the old mariner's compass.

The Splitdorf Electrical Company's space furnished us with a novel sight—no less than a complete power-boat lighting equipment in operation, consisting of dynamo, automatic indicating cutout and battery. A twelve-cylinder magneto was displayed running continuously, showing a production of twelve sparks. A low-tension magneto was shown operating under water. Also there was all the boating enthusiast could desire in the line of electrical equipment, such as hydrometers, voltmeters and ammeters and spark plugs, etc.

Stanley & Patterson showed us a marvel in electrical production, the "Golden Glow" searchlight. After much experimenting it has been found a greenish-yellow light is the one in which the human eye operates at its highest efficiency. With this fact established the famous "Golden Glow" parabolic reflector was developed. The reflectors are made from a peculiar golden-green glass into true parabolic shape. They are then silvered and this silvering is backed with copper and waterproof paint. Light passes from the incandescent lamp of the searchlight into the mirror, passing through the glass before striking the silvered reflecting surface; in this passage through the glass the blinding white light from the lamp has subtracted from it the blue and violet rays and it emerges from the reflector as a powerful shaft of light rich in the soft, non-blinding greenish-yellow rays of the spectrum. This is the famous "Golden Glow." The light is non-blinding, of high illuminating qualities, and possesses wonderful power to penetrate foggy atmosphere. Stanley & Patterson also showed a complete line of battery sets and other electrical accessories.

Stromberg Motor Devices Company displayed an exceptionably strong line of carbureters. They called particular attention to their type "M" carbureter as most applicable for power boats. This device is of the vertical type, simple in construction, durable and giving excellent service. The Stromberg also facilitates engine starting and cold engine troubles are almost a thing of the past, if your engine is equipped with a carbureter of this make. The Stromberg measures up to present-day requirements, when one must figure scarcity of gasolene and its consequent high cost, its depreciation in value and attendant difficulties.

Sumter low-tension magnetos for make-and-break ignition were featured prominently by the Sumter Electrical Company. Sumter, in addition to selling you high-grade ignition system for your engine, places at your service the assistance of experts to aid you in getting the exactly correct and most efficient equipment you need. Sumter Service Stations are in nearly all the larger cities and one can profit by this service when considering the installation of ignition.

Valentine's booth—well, we all know Valspar, "the varnish that won't turn white." The President's yacht. Mayflower, is Valsparred, so 'nuff said. An interesting test in the Valentine booth clearly showed how not even continued submersion in water will cause Valspar to turn white. Keeping its color and finish not alone makes Valspar so exceptional. It combines extremely quick drying with high durability. It can be walked on within 24 hours after application and does not chip, crack, peel, or scratch white. A coat will enhance the beauty of finely grained woods. Valspar possesses heavy body yet flows freely, giving a full brilliant coat. Through heat or cold, sun or rain, it retains its lustre undiminished.

Sutliffe-Madsen handle everything electrical. The feature of their show was the Apex low-voltage wireless outfit. Use the same 6 or 12-volt battery with which you light your boat to operate this equipment. The sending range is up to 20 miles while messages may be received as far as 500 miles distant. This outfit is adapted to the small power boat 35 to 100 ft. long, is of inestimable value. The plant is durable and dependable and fully guaranteed. Sutliffe-Madsen also show a complete line of marine electrical specialties and accessories.

Witherbee Ignitor Company showed us their Wico Ignition Type "R". There are many points of merit combined in this unit The type "R" is designed especially for heavy-duty high compression engines using low-grade fuel. Durability and reliability are the fundamentals incorporated in the perfection of Wico products. The type "E" ignition system has a minimum cost of operation, as no auxiliary battery service is required. The machine may be attached to any engine with simple and inexpensive fittings and the beauty of the system is that the ignition need not be installed in a certain fixed relation to the engine crank shaft or cam shaft. Another good feature of the type "R" is that the igniter produces its strongest spark in the retarded instead of the advanced position, which fact may be readily seen as a distinct advantage in starting a cold engine.

Chicago Varnish Company's exhibit specialized on Navalite. This very superior varnish needs but one endorsement as a proof of its fine qualities. We find that it has been used on many of America's Cup Defenders, and as we look back of the records of these stately craft we can well realize the merit of Navalite. Chicago Varnish Company also showed us a complete line of marine specialties that go to make up the present-day pleasure boat.

"Woolsey, the old reliable," showed us the usual fine line of copper paints and marine paint specialties. Everything in paint and varnish for the salt or fresh-water power craft can be had from Woolsey. It is difficult to enhance the value of any one of Woolsey's products, but for the pleasure boat owner who prides himself on the appearance of "his little ship," let him look up "Yacht White" for exterior and interior white work where he desires finish and durability. Woolsey's "Copper Best Paint" also starred an excellent medium towards anti-fouling and a perfect protection from the ever-busy teredo worm.

Geo. B. Carpenter & Co. showed a complete line of up-to-date specialties for the discriminating power-boat man. Particular attention might be laid on the Carpenter Kraft Combination Seat and Berths. This is a simple, substantial and practical equipment suitable for boats of all sizes and types and can be readily installed at but small cost. Another worth-while exhibit by Carpenter was the Kainer Ropeless Steerer for power boats which compares favorably with the finest types of automobile steering gears. A positive direct connection between the steering wheel and rudder does away with all back lash and stretching of tiller ropes. This outfit, in addition to being noiseless and positive, is self-locking and the gearing holds the rudder in any position in which it may be placed.

Ericsson Manufacturing Company specialize the Berling Magneto and types "D" and "DD"—the former a high-tension two-spark independent magneto, the latter a high-tension two-spark dual magneto. This type is especially designed for heavy-duty engines, wherein the charge in each cylinder is ignited simultaneously at two separate sparks. In this manner complete combustion is more rapidly produced and greater horsepower is developed. The Ericsson Igniter combines simplicity with minimum current consumption.

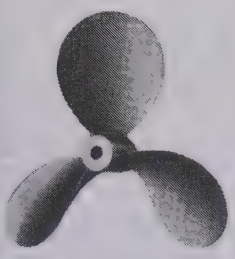
We next come to the booth of the Columbian Brass Foundry and find they carry a full line of power-boat accessories. The Columbian Propellers, manufactured of the finest Columbian Manganese Bronze and guaranteed accurate as to pitch, balance, workmanship and against breakage. Columbian propellers can be had for any type of boat, and this fact is substantiated when we realize there are 2,000 Columbian patterns to select from of varying blade area, diameter and pitch. The Columbian wheel is designed to produce maximum power efficiency and certainly meets these requirements satisfactorily. In all Columbian equipment workmanship and material used are of the very highest quality.

Higgins & Seiter, Inc., had a very attractive display of yacht china and glassware. Their specialties are private designs incorporated in dinner sets, glassware of all kinds, etc. These designs usually take the form of finely enameled flags, private crests and seals, etc., worked in conjunction with exclusive designs or patterns to meet the tastes of the fastidious owners of pleasure craft.

Edison Storage Battery Company showed a complete line of batteries for all purposes. The Edison Battery is too well known to receive special mention in an article of this length.

The Evans Stamping and Plating Company featured the Paragon Reverse Gear. Their slogan "More high-grade marine engine builders use Paragons than all other gears combined," is a slogan deserving of special attention. Paragons are built to give service, and every ounce of material that enters into the construction of these well-known gears is correct and especially adapted to meet the hard wear and abuse imposed on a marine reverse gear.

(Continued on page 32)



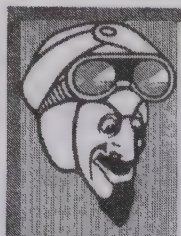
HYDE

TURBINE TYPE

Propellers

CATALOG FREE
UPON REQUEST

Hyde Windlass Co.
BATH - MAINE

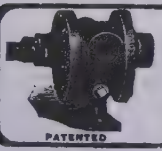


BOSCH

The ignition that is used by the world's fastest boats because it is the most reliable and efficient.

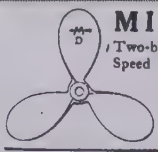
Be Satisfied Specify Bosch

Bosch Magneto Co.
221 West 46th St., New York



PATENTED

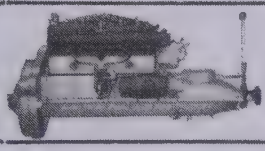
If you want good circulation on your
Automobile, Launch or Motor Boat, use a
LOBEE PUMP
Lobee Pump & Machinery Co.
17-21 Parish Street, Buffalo, N. Y.



MICHIGAN WHEELS

Two-blade, Three-blade, Solid and Reversible Wheels, Speed Wheels, Weedless Wheels, Towing Wheels, and Wheels for Special Work. Send for Catalog describing the famous Michigan line.

MICHIGAN WHEEL CO.
1113 Monroe Ave., Grand Rapids, Mich., U. S. A.



GASOLENE
KEROSENE
DISTILLATE
10 to 150 H.P.

SCRIPPS MOTOR CO.
632 Lincoln Ave.
Detroit, U. S. A.

PNEUMATIC AND STEAM
STEERING ENGINES
NOISELESS, FOOL-PROOF AND DURABLE
Address STEERING ENGINES
VIKING IRON WORKS
Foot of 37th Street, Brooklyn, N. Y.

Mathis-Built 43-Ft. Cruiser Houseboat

for high-class design and construction with speed and comfort. Reasonable in first cost, economical in upkeep. Well-lighted and ventilated. Easily handled by one man. An efficient sea boat. Will make 9 miles an hour with 20 or 24-H.P. motor. Built for summer and winter use.

Ready for delivery on one week's notice.



43 ft. 12 ft. 2 ft. 6 in. draught

Write for particulars.

MATHIS YACHT BUILDING COMPANY
COOPER'S POINT CAMDEN, N. J.

Electric Row Boat Motor

Make your Row Boat an Electric Launch. Run a Jewel Two-Passenger Row Boat Motor (run by electricity). A source of dangerous gas is impossible. Simple, noiseless and powerful. Attaches to any Row Boat and runs on two six volt Batteries. This is our 35th successful year.

Open Window Battery

Look inside your storage battery through the open window. See condition of plates and height of electrolyte. If you need a new serviceable starting battery buy a Jewel and save money. $4.00 Special $3.00.

MOTORCYCLE ELECTRIC LIGHTING SYSTEM

The Jewel Motorcycle Motorcycle Storage Battery and connects lighting system is a combination. Agents wanted. Write for prices and catalog R.

JEWEL ELECTRIC COMPANY, 112 N. Fifth Ave., Chicago

HOLLOW SPRUCE SPARS

PALMER BOAT COMPANY
Fontana, Wis. ON GENEVA LAKE
Formerly at Highland Park, Ill.

What's the Course from Huckleberry Island to Stratford Shoal?

Find the answer in the POCKET COURSE BOOK

Price Twenty-five Cents

THE RUDDER PUBLISHING CO.
254 W. 34th Street, New York

J. W. Lathrop Co.

Mystic, Conn.
Manufacturers of
MARINE GASOLENE **Engines**

Koukokusha ni otegami onsashidashi no saiwa dozo RUDDER nite goran no mune onkakisoe negaimasu

(Continued from page 30)

Matthews Boat Company were well represented. They have been in business over a quarter of a century and are highly skilled in the production of boats of all sizes for all waters and purposes. If you desire anything from a luxurious cruising yacht to a yacht tender you can have it from Matthews, and they will give you the benefit of their experience and co-operate with you in the design of the particular boat you want. The high quality of Matthews boats is universally recognized.

Chas. P. McClellan, of Fall River, specializes in a complete line of auto-boat tops, life-preservers, cushions, spray hoods and boat covers. Particular emphasis is laid on the McClellan Patented Safety One-Man Top, which was perfected through the growing demand for comfort of power-craft passengers in all kinds of adverse weather. This device embodies durability service with simplicity of construction. If you have an open boat you need an Auto-Boat Top, which will safeguard you from the annoyance and discomforts so often caused by the elements.

The 1917 "Jasco" tanks were exhibited by Janney, Steinmetz & Co. These tanks are available and specially constructed for power-boat use, round or square, in all sizes from one to 235 gallons capacity. The power-boat man must realize the importance of having a proper gasolene container, as gasolene is a highly inflammable liquid that vaporizes readily. Once gasolene becomes a gas it is transformed into a dangerous explosive. "Jasco" tanks safeguard against this danger, for every tank is tested to insure their being leakless, under a fair pressure.

Monarch Valve Company introduces us to the Monarch Standard Carbureter as the feature of their line of gas-engine specialties. This is a standard float-feed carbureter that possesses all up-to-date adjustments and will come up to all requirements and fulfil all the needs of the power-boat owner. In a recent test by one of the largest engine builders in America the Monarch Standard Carbureter proved to be the most efficient on horsepower and fuel consumption tests.

"Hyde" Propellers prove the feature at the booth of the Hyde Windlass Company. The Hyde turbine type wheel has demonstrated its excellency for a long time in every kind of boat, from a light hydroplane to the heavy work boat. The wheel is designed on the true screw principle and possesses generous blade area. When we find out the Miss Minneapolis, the fastest boat in the world, is equipped with a Hyde propeller we take our hats off and pay silent tribute to this wonderful wheel. Hyde propellers are also used by the United States Navy, for, in addition to perfection of design, they are made of the finest material, in the form of Hyde Manganese Bronze, which is guaranteed to meet all Government requirements. "Hyde No-Weed" will take you through weeds, eelgrass or other marine growth without fouling the wheel.

Pyrene was there with an interesting exhibition of the efficiency of its product in smothering a fire. Pyrene should be everywhere—especially on every power boat afloat. You need it to protect yourself and your friends against accidents or negligence pertaining to fires. Pyrene will extinguish gasolene fires completely. The chemicals simply blanket the blaze and shut off the air so that flames cannot live. Pyrene is used in all the navies in the world, it is used by the great armies in the trenches. The United States Government endorses it. Therefore you should have it on your power boat.

The Navy Gear Company show us Navy Gears designed by Mr. Joseph Petrelli, better known to the marine world as Joe. Joe has been at the job of perfecting his invention for thirteen years and now his product comes up to all the requirements of the United States Government, who require in the Navy a gear that will run in reverse motion for 15 minutes transmitting 50% of horsepower. You can easily see a gear designed to meet this strain must be strong, durable and of sufficient size to prevent excessive wear. The Navy Gear meets all these requirements.

The New Jersey Paint Works sell a line of pure linseed oil mixed paints. These paints are manufactured and guaranteed to meet the demand for a reliable paint put up in small quantities for the power-boat owner, who may only have occasion to use a little paint at a time. Of course, large quantities can be had as well. On each can is placed a large color spot which greatly aids the buyer in getting the desired color.

J. H. Curtiss displayed a complete line of high-class marine toilets. These closets are very durable and can be had in polished mahogany or quartered oak seat. The gear is very simple and efficient. The Curtiss closet combines the ornamental with the practical elements of construction, and fine workmanship and material combine to make it one of the finest yacht closets built.

Cutting & Washington introduced us to one of the most interesting exhibits. We hear so much about and see the need for wireless these days that wireless outfits for yachts interest us very much. The power-boat owner who used to cruise away and lose touch with the world for a few days or weeks can no longer afford to do so. Times are such that you never know what will happen next. With the Cutting & Washington complete wireless outfit, however, you are able to spend a few days on the water, yet keep in touch with your friends and your business. The type 2A ½ kw. installation has been adapted to power-boat use. This apparatus operates by a combination of the Chaffee system of impact excitation and the C and W tone system. The result is a set which is smaller for the power, has greater transmitting distance for the power and gives greater distance per dollar. Look into this necessary adjunct for your boat—you will be more than interested.

The general display of boat equipments at this, the 1917 Boat Show, was more complete than ever before, and we believe that the efforts of the firms represented will be repaid by the publicity given to the merit of their wares. On every side we saw where the grim hand of war exigency had produced some new invention. Preparedness permeated the whole fabric of the show, and back of every exhibit stood in imagination the figure of old Uncle Sam utilizing this or that equipment for the benefit of the Nation.

* * *

A NEW YACHT PUMP CLOSET

W. H. Goblet, who manufactures the Goblet Bronze Ball Valve Closet, has this season built a new line of fixtures that are unusual. All moving parts are inclosed within the cylinder heads, and by this arrangement of valves he claims they are the most silent working yacht pump closets on the market. The arrangement of moving parts within the cylinder has enabled him to make a neater and a more compact fixture, and one that is always practical from abuse or accidents.

* * *

MATTHEWS ELECTRIC CAPSTAN

A powerful electrically operated capstan, capable of "breaking out" and hauling inboard the heaviest anchors. Small, compact and lightweight. Can be installed on any boat from 50 to 125 ft., simply bolted to deck—no holes to cut in decks. No mechanical knowledge required to operate. All mechanism inside the drum and above the deck. No exposed moving parts. Entirely water proof. Operates without noise. Installation very simple. Either chain or rope may be used.

To operate, you turn the switch and the motor starts. A shift of the clutch lever and the drum revolves, hauling in the cable. Releasing the clutch permits drum to revolve freely in either direction. When running free, it is controlled by a powerful brake. Capstan provided with pawls on ratchet for hand operation if desired. The cleanest, neatest capstan ever built for yacht use and manufactured solely by the Matthews Boat Company, of Port Clinton, Ohio.

* * *

ARROW, OF SOUTH BOSTON

The accompanying illustration shows the launch Arrow, owned by James Bertram, and enrolled in the South Boston Y. C. The picture was taken near the clubhouse of this organization.

Mr. Bertram's boat is powered with a model F. 28-36 h. p. Red Wing Thoroughbred motor, made by the Red Wing Motor



Company, of Red Wing, Minn. This power plant drives the Arrow at 18 real miles an hour. Arrow is a 20-ft. V-bottom with 4 ft. 8 in. beam, and is one of the most reliable as well as one of the speediest outfits in the South Boston Club.

Real WOLVERINE Power

"The Motor With the Bore & Stroke"

Fuel Cost Reduced

from 70 to 80% without sacrificing reliability, flexibility or control. Perfect combustion on Kerosene or lowest grade of Coast Distillate.

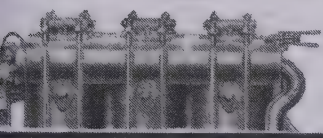
Sizes from 5 to 200 H. P.
1 to 6 Cylinders

Kerosene

The gasoline question has been solved by the

WOLVERINE MOTOR WORKS
Bridgeport, Conn., U. S. A.





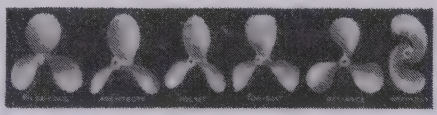
VALVE-IN-HEAD

FRISBIE - The Friendly Motor

4-cycle, one to six cylinder, 3 H.P. to 75 H.P. Gasolene or Kerosene. Send for Catalog

FRISBIE MOTOR CO., Cono St., Middletown, Conn.

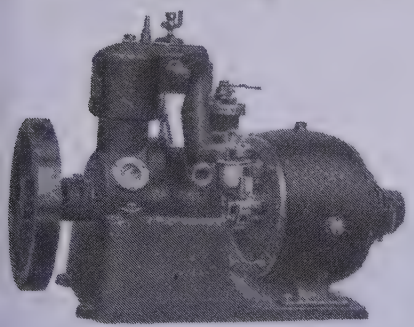
COLUMBIAN PROPELLERS



Your Boat Should Be
COLUMBIAN DRIVEN
We can show you *greatest efficiency.*
Write for "Propellers in a Nut Shell."

COLUMBIAN BRASS FOUNDRY
214 N. MAIN ST. FREEPORT, LONG ISLAND, N. Y.

Yacht Lighting Outfit



A HIGHLY developed direct-connected Generator Set. Used on some of the finest yachts built during the ast few seasons. Nothing like it in existence, for those ishing a compact and reliable plant, suitable for yachts from to 80 feet, operating interior, running lights, electric fans, archlights, etc. The air compressor may be used for histle, air pressure on water tanks, or supplying air pres-re for starting engine. Used by U. S. Government on out cruisers. ¶ Let me send you a few Light facts.

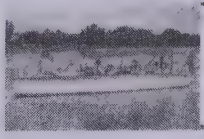
. S. MILLS, 173 Lexington Ave., Brooklyn, N. Y.

MONARCH CARBURETERS

Are adapted for Two and Four-stroke Engines. Once set to the proper speed of your engine, require no further adjustment. They operate silently and give a wide range of speed on the throttle control alone.
There are no complicated adjustments; they fit all makes of Engines

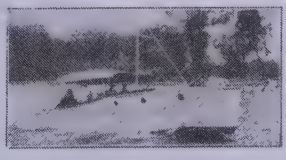
We Manufacture Auxiliary Air Valves, Gas Engine Check Valves, Stuffing Boxes and Suction Strainers

MONARCH VALVE CO., 112 Front Street, Brooklyn, N. Y., U. S. A.



STANDARD BOATS

Carries in Stock 16, 18, 21, 23, 26, 27 and 30 ft.
Prices $180.00 and up
Also New Models—[illegible] $700
Illustrated Circular [illegible]
EVERETT HUNTER BOAT CO., McKinney, Tex.



VALLEY BOATS

From Stock Designs or especially designed to suit your requirements.

Cruisers, Runabouts, Hydroplanes. Rowboats (Motor Rowboats, and Something Better).

Lazy Lady VII, one of our 32-ft. day cruisers which is shown here making 15 miles per hour with 40 H.P. Let us know your requirements and we will quote prices on a suitable boat. You will secure prompt delivery and save money by placing your Order Early.

VALLEY BOAT COMPANY, 700 Hess St., Saginaw, Mich., U. S. A.

YACHTS CHANGE HANDS

The Hollis Burgess Yacht Agency has sold the following yachts:

56-ft. waterline schooner yacht Valmore, owned by Henry Pearce, Jr., of Providence, R. I., to Lester H. Monks, of Brookline, Mass.

65-ft. waterline auxiliary schooner Mariette, owned by J. Fred Brown, of Boston, to the Haytien government, for coast-guard service work.

52-ft. waterline Herreshoff racing sloop Avenger, owned by Charles K. Cummings and Reginald L. Robbins, of Boston, to Howland Twombly, of Boston.

Class P sloop Stranger, owned by Lindsley Loring, of Westwood, Mass., to Frank C. Paine, of Boston.

39-ft. waterline auxiliary yawl Hyperion, owned by W. N. Bavier, of New Rochelle, N. Y., to H. A. Chapman, of Bangor, Me.

35-ft. waterline auxiliary ketch Bonnie Jean, owned by Francis C. Grant, of Philadelphia, to Julian M. Wright, of New York.

32-ft. 100-h. p. speed power boat Siwash, owned by Charles H. Hitchcock, of Brookline, Mass., to Josef Hofmann, the famous pianist.

21-ft. waterline sloop Gypsy, owned by Frank C. Paine, of Boston, to Charles E. Benton, of Boston.

Sonder sloop Vim, owned by J. Cleary, of Portsmouth, N. H., to Caleb Loring, of Boston.

Sonder sloop Coot, owned by Robert F. Herrick, of Boston, to Ralph C. Goudey, of Boston.

Fast 33-ft. runabout Deidre, owned by Philip S. Sweetser, of Waban, Mass., to W. H. Moses, of Tilton, N. H.

28-ft. waterline yawl Navita owned by Dr. Henry Hawkins, of Dorchester, Mass., to Thomas J. Murphy, of Revere, Mass.

18-ft. waterline racing sloop Scaler, owned by E. A. Flye, of Gloucester, Mass., to Eliot Mildram, of Boston.

Marblehead one-design 17-ft. class knockabout Dormouse, owned by Frank E. Peabody, of Boston, to Christopher I. Flye, of Newtonville, Mass.

22-ft. waterline racing sloop Tyro, owned by Hollis Burgess, to a well-known New York yachtsman.

18-ft. waterline racing sloop Cheroot, owned by Ralph S. Hendrie, of Wollaston, Mass., to Commodore Walter D. Lane, of the South Boston Y. C.

Catboat Midge, owned by Eliot S. Mildram, of Hingham, Mass., to Everett A. Flye, of Gloucester, Mass.

Herreshoff 21-ft. racing sloop Saracen, owned by Robert Winsor, of Boston, to Walter Kelley, of Boston.

40-ft. power boat Victor, owned by Conrad Rueter, of Jamaica Plain, Mass., to Willard Welsh, of Boston.

Sonder sloop Panther, owned by Hans Wickenhauser, of New York, to a well-known Boston yachtsman.

* * *

ENTER THE "WONDER MOTOR"

"A service station always at hand," is the slogan of the Elbridge Engine Company, manufacturers of the new engine which they call the "Wonder Motor." Nearly all of the essential parts of this motor are interchangeable with parts of the Ford automobile engine and, as everyone knows, these parts may be readily secured at small cost almost anywhere in the civilized world.

Many a boat owner has been placed where he would give much to be able to get some repair part at once, and where the delay caused by having to send away for it has spoiled his vacation or a joyous week-end. This feature should make this engine a popular one.

Not only can parts be obtained in almost any town for the "Wonder Motor," but as garage men everywhere understand the Ford motor there is no trouble to find a repair man to make repairs or adjustments to the engine.

The manufacturers claim wonderful flexibility for the "Wonder Motor," enabling the boat owner to slow down to a snail's pace or speed up to 20 miles per hour at will. Those interested will find the advertisement of the Elbridge Engine Company on page 38 of this issue of THE RUDDER.

* * *

STERLING ENCLOSED RUNABOUT AND LIGHT CRUISER ENGINE

The Sterling Engine Company, of Buffalo, N. Y., have ready for delivery an entirely enclosed engine suitable for runabouts and small cruisers. This engine has a bore of 3¼-in., stroke 5½-in., and weighs 600 lbs., with regular equipment. The rating of this motor is 17 h. p., at 600 r. p. m.; 25 h. p., at 1000 r. p. m.; 30 h. p. at 1200 r. p. m.

The engine can be furnished with electric starter, rear hand starter, or without electric or rear starter. On account of the general demand for the electric starting and lighting system, the Sterling Engine Company prefer equipping the engine in that way, for it is then as easily started and controlled as the up-to-date automobile.

The crank shaft is carried in the upper base, and even after years of service the bearings can be quickly taken up by simply removing a few screws holding the upper and lower base and hinging back the engine, exposing all working parts. With this construction, there is no danger of cramping or straining parts.

Pressure feed oiling system is used, thus providing efficient lubrication, regardless of the riding angle of the engine. There is a sump pit in the rear end of the lower base. A powerful oil circulating pump draws the oil from the sump pit, and before entering the distributing tube the oil is filtered, thence carried under pressure to all main bearings, connecting rod bearings and reverse gear. A pressure gauge is furnished with regular equipment, which gives a constant check on the oiling system.

The Sterling Company advise us that the reverse gear and clutch are of their own design, and have a wide margin of safety. It is also stated that the ignition system, carbureter, propeller and all accessories, are the best obtainable, and consistent with the superior quality of the materials in the engine itself.

This engine is designed for the popular V-bottom runabout of today, and is highly efficient for this service. The clean finished appearance of the engine and the absence of visible moving parts should create an instant and forceful appeal.



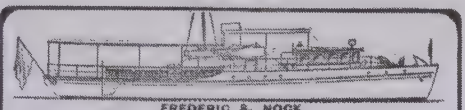
FREDERICK K. LORD
NAVAL ARCHITECT
Designer of Sail and Motor Boats
Tel. 4859 Rector — 120 BROADWAY, NEW YORK



BONNEY
Auxiliary Lifeboat Cruisers
Removable Sailing Rig, Non-Sinkable, Non-Capsizable, Four Full Berths, Toilet, Running Hot and Cold Water. Prices and Specifications on Application.
J. C. G. Bonney, Builder and Designer
60 John Street, New York

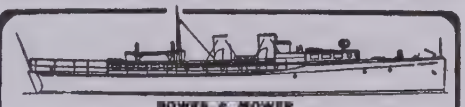
ARTHUR BINNEY Successor to Edward Burgess
Long Distance Telephone 70 KILBY STREET Mason Building BOSTON, MASS.
Naval Architect and Yacht Broker

FRANK BOWNE JONES, Yacht Agent
29 Broadway New York
HIGH-CLASS YACHTS OF ALL TYPES
Let me know your requirements



FREDERIC S. NOCK
NAVAL ARCHITECT AND YACHT BUILDER
L. D. Phone EAST GREENWICH, R. I. Cable NEMO

CAPE COD POWER DORY COMPANY
Cable Cruisers, 22-35 Ft. Open Power Dories, 20-24 Ft. Lake and River Boats, 18 Ft. Sailing Dories, 17 Ft. Rowboats, 10-14 Ft. Special Boats for Outboard Motors.
455 MAINE STREET WAREHAM, MASS.



BOWES & MOWER
NAVAL ARCHITECTS AND ENGINEERS YACHT AND VESSEL BROKER
Offices, Lafayette Building Chestnut and Fifth Streets
Bell Phone PHILADELPHIA, PA. Cable Bomo

TAMS, LEMOINE & CRANE
Naval Architects and Yacht Brokers
52 PINE STREET NEW YORK

Telephone Main 2019
EDSON B. SCHOCK
Naval Architect and Engineer
Auxiliary Motor Sailing Ships and Motor Freight and Lumber Carriers a Specialty
COLMAN BUILDING SEATTLE, WASH.

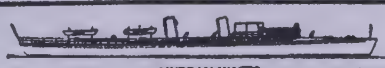
B. B. CROWNINSHIELD
H. W. KROGMAN E. N. BURBANK
Naval Architects, Marine Brokers
75 State St. Boston, Mass.

THEODORE D. WELLS
Naval Architect and Marine Engineer
32 BROADWAY, NEW YORK
Telephone Broad 6737

GIELOW & ORR
Naval Architects, Engineers and Brokers
52 BROADWAY, (TELEPHONE, 4870 AND 4874 BROAD) NEW YORK
Plans, Specifications and Estimates furnished for Construction, Alterations and Repairs. Large list of Yachts For Sale, Charter or Exchange; also Commercial Vessels

Naval Architects, Engineers, Yacht Brokers
COX & STEVENS
15 William St., New York
TELEPHONES: 1375-1376 Broad
Complete particulars, plans and photographs promptly submitted on receipt of inquiry. State your requirements. Large list of yachts of all types for sale or charter.

WILLIAM GARDNER & CO.
Naval Architects, Engineers, Yacht & Vessel Brokers
Yachts, Launches and Vessels of All Kinds
No. 1 BROADWAY, NEW YORK
Telephone 3585 Rector



Tel. Lombard 2289 J. MURRAY WATTS Cable Add. "Merwat"
Naval Architect and Engineer Yacht and Vessel Broker
Offices 807-808 Brown Bros. Building
888 Chestnut Street Philadelphia, Pa.



JOHN F. GOODWIN
NAVAL ARCHITECT
2 Concord St., W. Gloucester, Mass.
Fishing Schooners, Yachts and Power Boats Designed Models Made
Tel. 547-15

Bei Bestellungen beziehen Sie sich bitte auf THE RUDDER

MARINE GLUE

Jeffery's Marine Glue was discovered in 1840 by Mr. Alfred Jeffery & Co. That was seventy-seven years ago, and the new booklet we are about to issue will contain in concise form practically all the information in regard to this material that is available, and in view of the high quality of all the Marine Glues on which the Jeffery Trade-Mark is placed, we do not hesitate to ask all users to insist on having Jeffery's Marine Glue. In all the various grades it is the best for the money—the most serviceable. Pound for pound it will go further and do a better and more lasting job than any other make. Do not be deceived by cheap imitations; see that the trade-mark is on every package.

We would esteem it a privilege to answer any questions that may arise in regard to this material, and would be glad to send upon request our free booklet, Marine Glue—What to Use and How to Use It. For further particulars apply to L. W. Ferdinand & Co., 152 Kneeland Street, Boston, Mass.

* * *

COMBINED HAND AND POWER STEERER

The Bergesen Steering Engines have an easy moving piston in a quadrant or arch-shaped cylinder. Engines are also built with two, three, or more pistons or cylinders, one valve for each piston and cylinder, all controlled by one valve stem. These engines are designed to work under pressure of steam, air, gas, water or oil. Engines having more than one piston operate more economically than the single-piston engines. The two and three piston engines cost more to build. No joint materials are used in the make-up of cylinder heads or valve bonnets and therefore no blowouts can take place. Piston pivots and valve stems are fitted with metallic packing. The movements of the engine



pistons are controlled by a new and specially designed valve that is durable and automatically takes up its own wear. The valve motion is small and rotative and is controlled from the pilot house or bridge, or from any other suitable place on the boat or ship. For short and quick work, lever control in pilot house is superior to a wheel control; the lever control has the advantage of directly indicating the position of the rudder. They build the steering engines to meet the requirements on the vessels for which they are ordered. There are no bolts, nuts or washers in the interior working parts of these engines. To any one interested, full details and description will be sent by Viking Iron Works, Foot 37th Street, Brooklyn, New York.

STANDARD MARINE PRACTICE

In the January issue of *Standard Marine Practice*, published by the Standard Motor Construction Company, and printed by Thomson & Co., editor Brown has a very interesting article on "Modern Grinding and Sizing," with numerous illustrations; "The Care of the Battery," "Propellers Simplified" and plans and description of Standard-equipped boats—both pleasure and commercial types. To any one interested, they will send a copy, and the issue is full of useful information.

* * *

TVEDT ADJUSTABLE MUFFLER

Thos. T. Tvedt, an engineer of practical experience, after experimenting without success with the various types of mufflers built for gas engines, decided to build one on his own ideas, and obtained some remarkable results.

An engine that had the reputation of being well designed and built but frightfully noisy in operation was his first test. The owner had every confidence in the engine but seriously objected to the noise. Last Spring Mr. Tvedt installed his muffler, started the engine, and went up on deck. The owner was told the engine was running, and after listening intently did not believe it until he visited the engine room and saw the engine in operation.

The Tvedt Adjustable Muffler is adapted for all types of internal combustion engines, and is guaranteed to silence the largest engines built without loss of power, and in many cases will add revolutions to present installations. It is made in all sizes, 4 inches to 1½-inch connections, any length desired, and suitable for installation in all boats. Its great value lies in you being able to adjust it until you obtain desired results in silence, and once adjusted requires no further attention.

* * *

GIELOW & ORR

Oliver B. Capelle has joined the yacht brokerage department of Gielow & Orr, naval architects and brokers, at 52 Broadway, New York City. Gielow & Orr is one of the oldest and best established firms engaged in yacht brokerage. It is said to have the largest list of yachts for sale, charter and exchange, of any marine brokers. Upward of five thousand yachts are on the list, so that regardless of the type, size, cost, equipment, or class of service, a client has in mind, Gielow & Orr is in a position to take care of it. The growth of this firm's dealings in yacht brokerage is so marked that additions to its staff have become peremptory, and the acquisition of Mr. Capelle is but one of several that are expected this Spring.

* * *

NEW COMPANY

E. D. Loane, of the Loane-Trask Engineering Company of Baltimore, has recently acquired by purchase all of the interests and stockholdings of Mr. Trask, who is no longer interested in the corporation. The name of the corporation will be changed to the Loane Engineering Company, and the capital materially increased. Arrangements have also been effected to materially increase the product of fisherman engines, which have been manufactured by Mr. Loane and his associates for the last 15 years. Mr. J. T. Loane, the son of E. D. Loane, and who has been connected with the company for the past 18 months, will assume the position of chief engineer and assistant manager.

THE STANLEY COMPANY Gasolene Marine Motors 48 Loring Avenue Salem Mass.

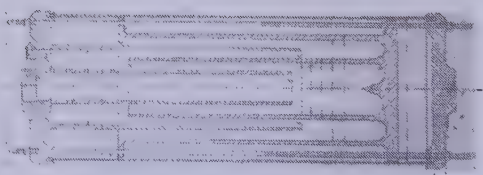
Tvedt's Adjustable Muffler

Suitable for all internal-combustion engines.

Insures silence without back pressure or loss of power.

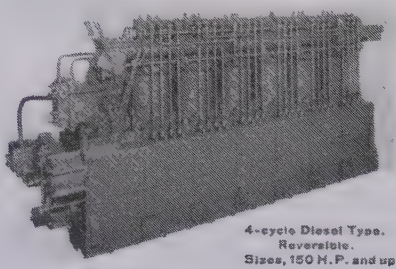
A revelation in muffler science and adjustable to any engine.

THOS. T. TVEDT COMPANY
Sole Manufacturers
Send for circular and price list
GREENPORT, LONG ISLAND - - NEW YORK



Hagan el favor mencionar el RUDDER cuando escriven

CRAIG OIL ENGINES



4-cycle Diesel Type.
Reversible.
Sizes, 150 H. P. and up.

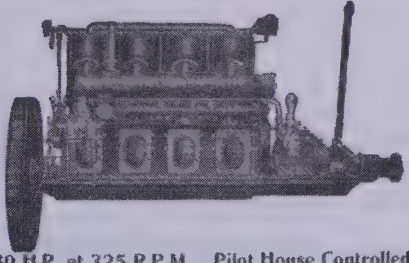
Desirable for all Types of Vessels

Service and Economies so pronounced that present unsatisfactory practices are made practical successes.

JAMES CRAIG ENGINE & MACHINE WORKS
807 GARFIELD AVE. JERSEY CITY, N. J.
Established 1898

MONARCH

Paraffin, Petrol or Kerosene, also Gasolene
MARINE MOTORS



80 H.P. at 325 R.P.M. Pilot House Controlled
Four-Cycle Type 5 to 160 H.P. Four Sizes

Reliability and durability secured by slow speed, perfect lubrication, large bearing surfaces, and ample strain-resisting material.

Ask for Catalog 11

RESPONSIBLE SALES AGENTS WANTED

Grand Rapids Gas. Engine & Yacht Co.
100 FRONT STREET GRAND RAPIDS, MICH.







Islander—a Real Cruiser

Islander is a 51 ft. x 12 ft. x 3 ft. 9 in. cruiser with a cruising speed of 15 miles an hour and a maximum speed of 17 miles an hour. Designed and built for ocean-going work. Commodious accommodations, complete equipment and long cruising ability constitute this boat's chief characteristics. Designed by John G. Alden, built by Fred S. Nock for Mr. John P. Osborn, of Boston, this boat is equipped with the logical power plant—an eight-cylinder 5½ in. x 6 in. Van Blerck operating a 22 in. x 29 in. three-blade Columbian wheel at 700 R.P.M.

Write Van Blerck at New York for full details regarding the six models of the Van Blerck Motor

VAN BLERCK MOTOR COMPANY
50 EAST FORTY-SECOND ST., NEW YORK CITY
Works at Monroe, Mich.

Designing of Marine Gas Engines

By Chas. Desmond

PART IV

I WILL now explain actual designing and I propose to do it by making use of a method I have found most satisfactory for instructing students in my classes of instruction.

Reading and learning explanations of mere calculations and formula is uninteresting to the average student; but if I put before him an actual engine, or a designing problem, and after having briefly explained the working principles, the use of the various parts, and the fundamental principles of the design, I ask him to use his brain and try to produce a better and more efficient design for a similar engine, telling him at the same time that I will do all that lies in my power to explain the work and each designing problem, as he reaches it, his interest soon becomes so intense that he learns in about one-fifth of the time it takes to learn under the generally followed methods of instructing.

So I am going to explain engine designing by placing before you actual designing problems of the kind set before me by gas engine builders in need of an engine design.

I will assume that you—the readers of these articles—have an ordinary amount of education and ability, and a sufficient knowledge of marine gas engines to enable you to understand my explanations; and keeping this assumption in mind, I will cover the designing problems from beginning to end, explaining how they should be tackled, how each calculation should be made, and how the accuracy of designing ideas can be proved.

I will do these things by expressing my thoughts in writing, or as one of my students tersely terms it, "thinking out loud". And from beginning to end of the work I will try my best to eliminate technical terms and to use mathematical formula that can be understood by anyone having a fair knowledge of the simple rules of arithmetic.

I will begin at the beginning of things and place before you a copy of a letter written by a client when he ordered a design for a small two-cycle marine gas engine:*

(Copy of Letter)

Dear Sir: I want you to design and prepare a set of working drawings for a small moderate speed and weight two-cycle, 3-port marine engine that will develop not less than 5 actual H.P. per cylinder at 500 r.p.m. For the purpose of explaining my ideas I enclose outline sketch of an engine that I like the looks of.

I want an engine that I can put on the market at a moderate price, and I want the design prepared so that I can use as many parts as possible of the one-cylinder unit when building 2-, 3-, and 4-cylinder units. If it is possible to do so I want you to make the design one from which I can build engines to use either gasolene, kerosene, or fuel oil.

I don't expect to be able to use the three fuels at will in one engine, but I do want to be able, by means of adding, or changing a few parts, to build engines for the three fuels named. I am told this can be done.

Regarding materials, I want to use ordinary castings, materials, stock fittings and drop-forged connecting rods, and a good make of stock reverse gear. I will build the engines in lots of about 25 in a moderate-sized machine shop that is equipped with modern machine tools and equipment. I enclose a list of the principal large tools in the shop.

The selection of bore and stroke I leave to you, and you can use the three-port system; but please keep in mind that I want the engine to develop its full rated H.P. when in operation in the hands of a boat owner of ordinary intelligence.

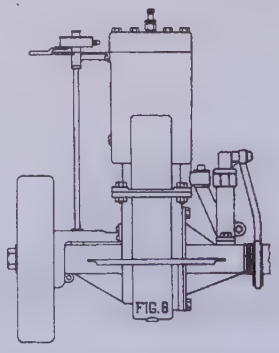
Don't skimp on power, because I have found that the average two-cycle engine falls off from 15 to 20% in power when operated under ordinary service conditions by the average boat owner.

One more detail: I want a complete design for a "fool-proof" medium-duty engine, and I want you to work out for me a simple numbering shop system that can be used for numbering patterns, checking parts, and keeping track of costs and stock.

For the work I will pay you in accordance with terms and prices mentioned in yours of ———.

(Signed)

The above is a clearly-stated designing problem and I will begin by showing you the sketch referred to in letter, and printing a copy of the tool list.



COPY OF TOOLS MENTIONED IN LETTER

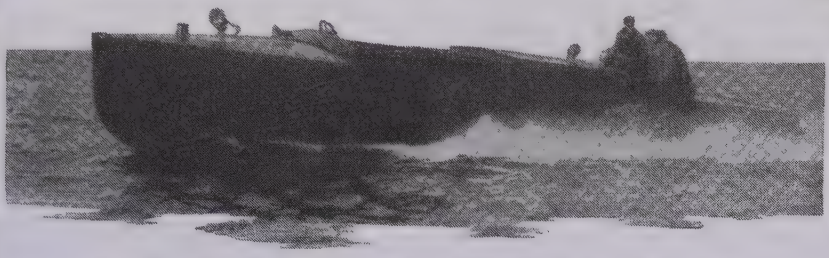
1 Gisholt lathe, adapted for finishing crank shafts
5 ordinary lathes, sizes from 14" × 6' up to 20" × 15'.
1 Heald cylinder grinder; also grinder for pistons and piston rings.
1 Smith & Mills 14" shaper.
1 No. 8 miller.
1 American radial drill press—large.

(Continued on page 12)

*I have selected a two-cycle design because it is the simpler problem. After I have completed my explanations and the design for a two-cycle engine I will take up a similar problem of four-cycle designing.

DUESENBERG

PATROL MODEL
MARINE ENGINES



"Mar-y-Cel," 40x9 Displacement Runabout, owned by Charles Deering, built and designed by the Albany Boat Corporation. Powered with an eight-cylinder DUESENBERG Patrol Model Engine.

Duesenberg Wins at Miami

THIRD ANNUAL MIAMI REGATTA

Three Races in Three Days Won by
Mar-y-Cel and the DUESENBERG.

First Day—15-mile race for displacement runabouts.
Speed 37.7 miles per hour, fastest time ever made by a displacement runabout in a race.

Second Day—10-mile race for displacement runabouts.

Third Day—20-mile race for displacement runabouts.

The engine installed in Mar-y-Cel is an eight-cylinder 6¾ x 7¾ in. Patrol Model Engine, developing 400 H.P. at 1500 R.P.M.

In actual service DUESENBERG Patrol Model Engines have proven themselves to be all we have claimed they would be—the one consistent, dependable big motor of the day. Built solely for those who want and can afford the best.

6-cylinder, 6¾ x 7¾ in., 200-300 H.P. . . $4800
8-cylinder, 6¾ x 7¾ in., 275-400 H.P. . . 6250

Complete with Leece-Neville electric starting and lighting system.

Let us submit complete specifications and certified test cards. Whether you want a power plant for a motor boat, automobile or aeroplane, the DUESENBERG will be your ultimate choice.

DUESENBERG MOTORS CORPORATION, General Sales Office, 120 Broadway, N. Y. C.



(Continued from page 10)

2 Fairbanks drill presses.
1 planer 45" × 12'.
1 B. & S. horizontal boring machine, two spindles and miller.

When such a problem is set before me I begin work on it by carefully tabulating all particulars on a form prepared for the purpose. The form is arranged in such a manner that I can tabulate both my client's wishes and my preliminary decisions, and you will note there are lines for entering my preliminary selection for many details not usually given by a client. So when this form is filled in I have before me a full description and record that can be used as a starting point for my actual designing work.

You may ask how do I reach a decision about each item? To such a question my answer is: I take up each item in succession and by making use of my knowledge of parts, details, construction and designing, I select the things I think will be most suitable.

Bear in mind that preliminary particulars are for the purpose of giving me a starting point, and are not supposed either to be final, or to take the place of detailed calculations that must be made before a designer can know that his design will prove satisfactory.

So I print below a copy of my preliminary description sheet, having entered on it all particulars given by my client and my selected preliminary details; and immediately below the sheet I explain each selection and how I arrived at it. Any man who desires to design a two-cycle engine of similar type can work out the particulars for himself. For you must remember that the sole purpose of these articles is to explain how you, the reader, can design an engine in accordance with *your* ideas.

My ideas of form, of proportions, of details, may not conform with yours, but my method of making calculations and doing the work can be used by any one who sincerely desires to design an engine that is really his own.

Explanation of Items on Form

Items 1 and 2 are in accordance with client's instructions.

Item 3.—As this is left for me to decide, I turn to my table of approximate power that can be obtained from two-cycle marine engines of various proportions of bore and stroke, and select dimensions that will give the desired power. Bear in mind that as this is only an approximation for preliminary purposes, I am satisfied to select proportions that are likely to give the power required at the named number of revolutions. The power desired is 5 b.h.p. per cylinder but as my client mentioned that he wants this power when engine is running under *average* conditions and also mentioned 15-20% as his estimate of power lost through defects in installation and from other causes beyond his control, I will add a proper percentage and select a bore and stroke that will be sufficiently large to deliver about 6 b.h.p. at 500 r.p.m. or 1.20 b.h.p. per 100 revolutions.

(Continued on page 14)

Copy of Form

Order No..... Date .....

Design for 2-Cycle Marine Engine..... Wanted.....

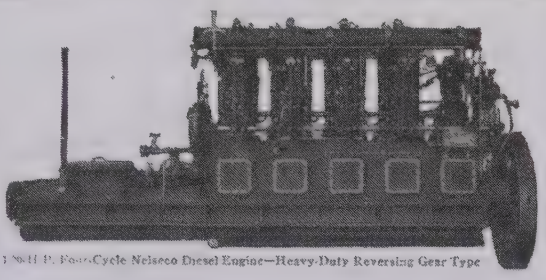
No.	Particulars of Engine	Client Wants	My Preliminary Decision
1.	Type.....	2-cycle, 3-port.....	3-port type.
2.	H.P. per Cylinder.....	5 at 500 revolutions	Satisfactory.
3.	Bore and Stroke.....	Left to me.....	5" x 5½"
4.	No. of Cylinders.....	Units of one arranged for building 2, 3, 4-cylinder units.....	Separated cylinders.
5.	Fuel.....	Gasolene, Kerosene, Fuel oil	Can be done.
6.	Weight.....	Moderate.....	About 280 lb. per cylinder.
7.	Ignition.....	Not given. J. S. shown on sketch....	J. S. for gas. J. S. for kerosene. Hot B for F. O.
8.	Oiling.....	Not stated.....	In gas for gas. Oiler for K and F. O. Grease for bearings.
9.	Water Pump	Plunger on sketch.....	Plunger.
10.	Cylinder.....	With separate head on sketch.....	Separate head and cast with base attached.
11.	Base Casting.....	Shown separated	Attached to cylinder.
12.	Crank Case.....	Shown as part of base.....	Separated along cl. of shaft.
13.	Crank Shaft.....	Drop-forged stock.....	Try Williams and U. F. Co.
14.	Bearings	.....	Babbitt.
15.	Flywheel.....	Taper attached on sketch.....	O. K.
16.	Piston.....	Can grind....	Cast-iron ground fit.
17.	Piston Rings.....	Can grind.....	Non-eccentric. N joint 5 rings
18.	Piston Pin	Can grind.....	Hollow steel. Try Graphite bearing
19.	Exhaust Outlet.....	Nothing said.....	Water-jacket. Independent casting
20.	Intake.....	Nothing said.....	Heated for kerosene. Separated
21.	Reverse.....	Stock	Try Paragon
22.	Thrust	Ball (shown on sketch).....	Try Bantam B. B.
23.	Coupling	Flange (shown on sketch).....	O. K.
24.	Carbureter	Stock make	Try S. or K. make
25.	Coil and Timer.....	Stock	Try Conn.
26.	Magneto	Stock	Try R. or K. make
27.	Batteries	Stock	Try Col.
28.	Fittings.....	Stock	Try Powell
29.	Starter	Stock	Handle for 1-cyl. Try J rear
30.	Muffler.....	Stock	

GOLD MEDAL

HIGHEST AWARD

MARINE DIESEL ENGINES

PANAMA-PACIFIC EXPOSITION



300 H. P. Four-Cycle Nelseco Diesel Engine—Heavy-Duty Reversing Gear Type

50,000 H.P.

NELSECO DIESEL ENGINES

In Service in American and Foreign Vessels

50,000 H.P. now building

Quick Delivery on 120 and 180 H.P. for Single Screw Installations

NEW LONDON SHIP & ENGINE CO., Groton, Conn., U. S. A.

PARAGON

REVERSE GEARS

are furnished as standard equipment on America's finest marine motors.

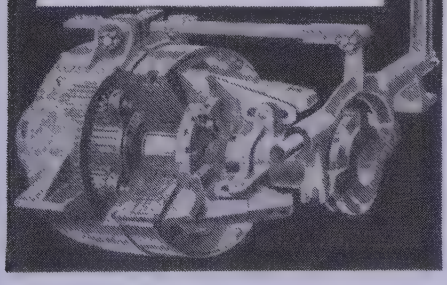
Your new motor should be Paragon geared. Insist on it.

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Box 888 TAUNTON, MASS.



Kahlenberg



"SEMI-DIESEL TYPE"

HEAVY-DUTY

ENGINES

Operate on Crude Oil and Kerosene

Continuous EFFICIENCY Guaranteed

Kahlenberg Standard Engines in medium and heavy-duty types are made in sizes from 2 to 54 H.P. and we would strongly recommend them for operation on KEROSENE, (PARAFFIN,) SOLAR OIL, and GAS OIL. You ought to know more of the exclusive advantages the Kahlenberg offers you.

Write today for catalog and booklet, "What Users Say."

KAHLENBERG BROS. CO.

Main Office & Factory 1708 12th St., Two Rivers, Wis., U. S. A.

Si prega far mensione del RUDDER quando scrivete

(Continued from page 12)

TABLE NO. 1.—FOR DETERMINING APPROXIMATE B.H.P. OF 2-CYCLE MARINE ENGINES RUNNING AT REV. UP TO 1,000 PER MIN.

Bore in Inches	Stroke=Bore Plus 0	¼	½	¾	1	1¼	1½	Power delivered per 100 r.p.m. per cylinder.
3	0.26	0.28	0.30	0.33	0.36	0.39	0.42	
3¼	0.31	0.33	0.36	0.39	0.42	0.46	0.49	
3½	0.39	0.42	0.46	0.49	0.52	0.54	0.58	
3¾	0.48	0.51	0.54	0.58	0.62	0.66	0.70	
4	0.58	0.61	0.65	0.68	0.72	0.76	0.80	
4¼	0.69	0.73	0.77	0.81	0.85	0.89	0.92	
4½	0.82	0.86	0.90	0.94	0.99	1.04	1.09	
4¾	0.97	1.02	1.06	1.11	1.16	1.21	1.27	
5	1.13	1.18	1.23	1.28	1.33	1.38	1.43	
5¼	1.30	1.36	1.43	1.50	1.57	1.64		
5½	1.50	1.57	1.64	1.71	1.78			
5¾	1.71	1.79	1.87	1.96				
6	1.94	2.02	2.10					

To read the table: Take bore of engine and follow across column to heading that, added to bore, makes length of stroke. The figures at intersection will be the approximate B.H.P. per 100 r.p.m. By multiplying B.H.P. per 100 revolutions by the hundreds and fractions of hundred revolutions that engine is to run at, the approximate B.H.P. of engine at named number of revolutions will be ascertained.

Looking over the table I find that the required power per 100 revolutions (1.20) can be obtained from an engine having either of these dimensions: 4¾-inch bore by 6-inch stroke; 5-inch bore by 5¼-inch stroke; 5¼-inch bore by 5¼-inch stroke (slightly under). Of the three I prefer, for an engine to run at moderate speed, one having a longer stroke than the bore diameter. So I have selected the 5x5½ as being the best proportions.

In my explanations of the calculations I will explain the relative values of long and short stroke engines:

Item 4.—As it is desired to build 1, 2, 3, 4-cylinder units from this design I have selected the single-cylinder unit as being best.

Item 5.—Client's desires can be fulfilled by designing additional parts, pistons and heads for each fuel.

Item 6.—Weight of 280 lb for single-cylinder engine using gasolene is selected for preliminary calculation. The actual weight will be determined later. Kerosene and fuel oil units will be heavier.

Item 7.—Jump spark is shown on sketch and can be used satisfactorily on the gasolene and kerosene units. For fuel oil the hot bulb has been selected.

Item 8.—Oil in gasolene is satisfactory method for oiling cylinder and C rod when gasolene is used; but when kerosene or fuel oil is used a direct oiling system is likely to prove most satisfactory. The main bearings should be lubricated with grease.

Item 9.—Plunger pump is shown on sketch and is best for use on moderate speed engines of this type.

Items 10, 11, 12.—A separate head cylinder is necessary, because engine is to be designed for three fuels, and by using separate heads the one-cylinder pattern can be used for engines built to use any one of the fuels. Then, if cylinder from top down to the center of crank shaft is cast in one piece, any desired number of cylinders can be erected on a proper crank case casting, and thus units of 2, 3, 4, or more cylinders can be erected without adding greatly to pattern cost.

Items 13 to 30 need no explanation. The comments marked against each refer to names of selected parts, or to makers of parts.

So that now I have before me a concise tabulated list of preliminary particulars and I am ready to begin actual designing.

The first thing to do is to make calculations and determine these things:

1.—The I.H.P. and the B.H.P. of engine.
2.—The best compression pressure to use.
3.—The thickness of cylinder walls required.
4.—The diameter and dimensions of crank shaft.
5.—The diameter and weight of flywheel necessary.
6.—The dimensions of piston and piston rings, and of wrist pin.
7.—The dimensions of main bearings.
8.—The dimensions of connecting rod.
9.—The dimensions of ports.
10.—The dimensions for crank case and crank case pressure.
11.—The dimensions of water-cooling space and also pump dimensions.
12.—The weights of the various parts.
13.—The proper dimensions for intake and exhaust pipes.
14.—The proper dimensions for propeller shaft.

These calculations are not difficult ones to make, especially when explained and illustrated in the manner in which I will do these things, because I propose to eliminate all of the formulas requiring the use of advanced mathematics and to place at your disposal all data and tables of constants required.

Before explaining and making the calculations, I want to make sure that you have a clear understanding of the effect produced by compressing a mixture of gaseous air in the cylinder of a gas engine.

Heat is stored-up energy, and a heat unit is a measure of quantity, a B.T.U. being equivalent to 774 foot-pounds of energy. A certain quantity of heat always corresponds to a certain amount of work, and when a mixed charge of gas and air is compressed in the cylinder of a gas engine work is done upon it, and the work appears as heat in the form of increased temperature of the gas mixture. Thus, when a cylinder full of mixed gas and air is compressed by the movement of piston the temperature of mixture rises in proportion to pressure. The laws of compression are:

1st.—The pressure of a gas varies inversely with volume and directly with temperature.

2d.—The volume of a gas varies inversely with pressure and directly with temperature.

3d.—The temperature of a gas varies directly with both pressure and volume.

From these things you can understand that there must be a system or scale for measuring pressure, volume and temperature of gases.

For measuring pressure the scale used is called the *absolute pressure* scale, or the ordinary *gage* pressure plus 14.7 lb per square inch, (the atmospheric pressure). The ordinary gage registers 0 lb at atmospheric pressure, while the *absolute* gage registers 0 when there is a perfect vacuum and 14.7 lb at atmospheric pressure. It is important to remember this.

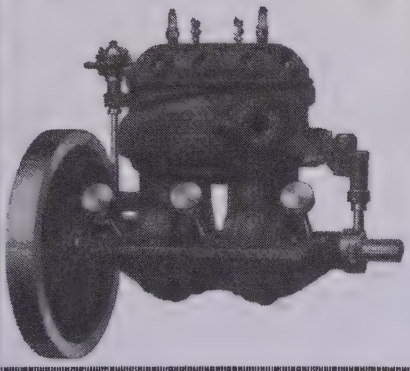
For measuring volume the generally used volume measures are used: Cubic-inches, etc.

(Continued on page 16)

Exactly What You Need for Your Small Boat

The Eagle line, designed especially to meet the requirements of small boats, offers an unusual assortment of engines for this class of boats. It includes high-speed, medium and heavy-duty engines so that you can select an engine perfectly suited to each type of boat.

The compact construction and light weight of our high-speed models makes them especially desirable for pleasure boats and tenders. The model 2-O is an exceptionally efficient engine for its bore, stroke and weight, and has driven 16 and 18-foot speed boats over 20 miles per hour. This model also makes an ideal power plant for runabouts up to 25 ft. in length.



Our medium-duty and heavy-duty engines will furnish continuous and absolutely dependable power under most severe working conditions in fishing boats, work boats, auxiliaries and other types of boats under 25 ft. in length.

By concentrating our efforts and utilizing our entire equipment and resources in the production of a varied line of low-powered engines, we feel that we are serving the small boat owner most efficiently. We carry a stock of engines, and are in a position to make immediate shipments of orders calling for catalog equipment.

Send for 1917 Catalog for Full Specifications

THE STANDARD CO., Torrington, Conn., U.S.A.

The **HARTFORD ENGINE** is used by the **FISHERMAN**

because it is the one engine that can be depended upon to run night and day throughout the year. Ask the Fisherman what he thinks of it. It is simply a substantial machine built to run under the worst possible conditions of weather—and does it. *Ask for Catalog M.*

THE GRAY & PRIOR MACHINE CO.

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ANDERSON ENGINES

ASK ANY USER

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"THE MOTOR THAT MOTES"

Real Kerosene Motors

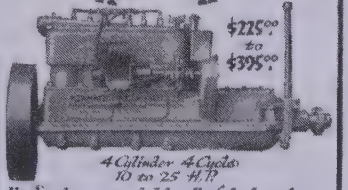
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AMERICA'S STANDARD FOUR-CYCLE ENGINE

BOAT KERMATH MOTORS



$225.00 to $395.00

4 Cylinder 4 Cycle 10 to 25 H.P.

Used and recommended by all of the best boat builders. An engine which insures you the most pleasure and service. Extremely smooth operating, perfectly controlled and quiet. *Catalog on request*

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Koukokusha ni otegami onsashidashi no saiwa doso RUDDER nite goran no mune onkakisoe negaimasu

(Continued from page 14)

For measuring temperatures a scale called the *absolute* scale of temperatures is used. This scale begin at 460.66° Fahrenheit *below* the ordinary Fahrenheit temperature scale, therefore when the expression *absolute temperature* is used bear in mind that it means 460.66° F. MORE than the ordinary F. scale temperature.

In other words, an ordinary scale F. temperature of 60° becomes 460.66 plus 60, or 520.66° on the *absolute* scale.

I will next say a few words about temperatures and pressures in cylinders of gas engines.

While the temperature of gas varies with volume, the rule does not hold good when the gas is mixed with other, and hotter, gases; as, for instance, with hot gases remaining in the cylinder of a gas engine after an explosion or impulse. Under such conditions the temperature will vary not only with volume but also with heat of gas remaining in cylinder, and with the ratio its volume bears to the volume of charge (gas) taken in.

Under average conditions of service it has been found that in engines working under between 60 and 75 lb gage pressure (74.7 to 89.7 lb absolute) the *absolute* temperature of charge when fully compressed and ready to ignite will be between 900 and 1,000° (950 is a fair average to use) and that when the mixture is properly proportioned and ignited the temperature at time of ignition will rise to about 3,400° *absolute.*

Now as the pressure of a gas rises in proportion to temperature the difference between initial and final temperature also expresses the difference between initial and final pressure, or the pressure exerted upon piston at time of ignition. And it is evident that as the temperature of igniting charge remains about 3,400° absolute regardless of initial temperature, the lower the initial temperature is the greater the pressure on piston will be for a given volume, and the more efficient and economical the engine will prove.

To illustrate this point, I will assume that the absolute initial temperature in cylinder of a certain engine is 980°. With a final temperature of 3,400° the pressure on piston is about 3.5 times the initial pressure. But suppose that, owing to some defect, such as excessive heating of incoming charge before it is admitted to cylinder, the temperature of compressed charge (the initial temperature) is raised to 1,100° absolute. Under these conditions the pressure on piston will only be about 3.09 times the initial pressure. Or suppose, on the other hand, that through superior design, mixing, and cooling of charge before it enters the cylinder, the initial temperature is reduced to 800° absolute. Under this condition the pressure on piston will rise to 4.25 times initial pressure with corresponding increase in power and efficiency.

It is, therefore, evident that the cooler the charge is when it is admitted to cylinder and the lower the initial temperature is the more power the engine will deliver per unit of bore and stroke.

Careful tests have proved that with each increase of pressure up to the limits of the engine there is a corresponding increase in efficiency and decrease in fuel consumption. Bear in mind that I say *within the limits* of the engine.

Every engine design is a compromise, because it is practically impossible to obtain best results from one feature without interfering with some other feature. The designer is continually giving away a little power at one place in the hope of gaining more than he lost at some other place. One engine may work most efficiently at 60 lb compression gage pressure while another can do best work at 75 lb; but under average conditions it will be found that the higher the compression is the greater the efficiency and economy will be.

It is safe to say that for each 10 lb increase in compression there will be a gain in efficiency of about 3% and a gain in fuel economy of about 3½%.

In the next part I will fully explain all the calculations and work out the data for the engine design now being considered.

(*To be Continued*)



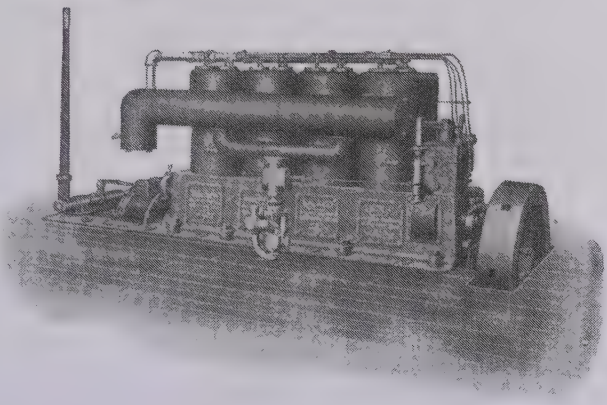
U. S. Coast Guard Tender, Powered With 4-Cyl. Gray

"The Automatic"

RELIABILITY and economy of operation—this is AUTOMATIC service.

An efficient engine for the finest boat built. Fitted with removable and adjustable bronze bearings, an enclosed governor, a dependable lubricating system, an intake manifold that delivers hot gas to the cylinders.

The AUTOMATIC has many other features. Let us send you full information.



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JOE'S FAMOUS REVERSE GEARS

Unexcelled for any type of boat from canoe to ocean tug. For motors from 1 H.P. to 500 H.P.

JOE'S
One-Way Clutches
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Prices minimum. Efficiency maximum. Send for 1917 Catalog.

SNOW & PETRELLI MFG. CO., New Haven, Conn.

MISSOURI OIL ENGINES

(Oil is cheaper)

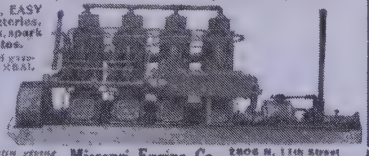
CHEAPEST POWER in the world. These engines will pay for their cost in the first year's run.

WE GUARANTEE that they will run on less than ONE gallon of kerosene, solar oil, or fuel oil per day of ten hours, i.e., with solar oil (@ $.05 a gallon, a 7-H.P. engine will run all day long for THIRTY-FIVE CENTS, or the 30-H.P. all-day run for $1.50.

EASY to start, EASY to run. No batteries, wires, switches, spark coils, or magnetos.

NOT a converted gasoline engine, but a REAL oil engine.

You can make a trip around the world and never have a dry-dock fee on your boat.



Send for bulletin giving full particulars and prices. Missouri Engine Co. 1806 N. 11th Street St. Louis, Mo., U. S. A.



Recognized the world over for consistent performance. Built for the man who demands more power and speed, greater economy and durability. Write for catalog of different models and sizes.

Type Q M 4 Cylinder 4 Cycle Bore 5¼ in. Stroke 6 in.

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Quarter-Deck Talk

COORDINATED PURCHASING

EVERY manufacturer necessarily has to purchase not only materials and supplies, but labor. For the former he considers it absolutely essential that he has a purchasing department, even if the functionary designated as "purchasing agent," as is not infrequently the case, be no more than a stenographer lacking in purchasing ability and experience, without any knowledge of quality or utility of supplies, and entirely devoid of knowledge of the various machining operations to which the material is subjected during its transition from raw to finished product.

In many instances, which almost any of us could call to mind without great effort, the amount of any particular material needed within any given period of time is probably unknown to the purchasing agent. He is equally ignorant of past, present and probable future prices, and delivery conditions. Any one about the plant may make oral requisition on him for material and supplies, and one or more others may feel called upon to duplicate or even triplicate or quadruplicate, with the result that several times the needed quantity may be purchased and have to be paid for, and then be carried in stock, possibly for years, with no possibility or probability of being eventually used.

This hit-or-miss method of requisitioning supplies and materials is one of the serious ills resulting from unbusinesslike organization, to which attention was called last month. There ever is present the possibility that the requisitioned supplies or materials may be in stock, or on order, when the careless or oral requisition is made without the knowledge or approval of the foreman, departmental head or superintendent, either one of whom readily might perceive that such a requisition already had been anticipated, or the supplies and materials would not be needed until later, or could not be afforded. In many shops where written requisitions are demanded, those responsible for the blanks themselves seem content to use small forms which convey little or no information to the purchasing agent, and no means are provided for a copy of the requisition to be retained to properly check receipts, or to prevent duplication or errors in ordering.

It is a serious mistake for any one to consider his responsibility ended when he hands such an unrecorded requisition to the purchasing agent. He should always tell him in writing whether or not there is any of the commodity requisitioned in stock; for what purpose it is needed; approximately how much will be required during the following three, six or twelve months; what can be used in case the exact material specified can not be obtained in ample time for use; when needed; the latest date of delivery allowable for economical use; the quality desired; whether or not used for other than the purpose specified and for what; from whom previous purchases have been made, and such other information as he may be able to convey to assist the purchasing agent in an intelligent handling of the requisition. When the requisition or purchase order has been properly countersigned, and thus approved by the works manager, superintendent, or officer on whom such responsibility falls, if the amount involved in the purchase exceeds a certain fixed limit, the secretary or treasurer should, in addition, indicate his approval, for upon either one or the other rests the responsibility of arranging payment.

Thus far well and good. But it is equally as important that a copy of the purchase order bearing its serial number as well as of the requisition, with price omitted, be immediately returned to the department from which the requisition emanated, and another copy be sent to the receiving department, that prompt delivery may be made direct if so specified in the order, or that the knowledge that the goods have arrived and have been duly delivered to the store room or stock may be conveyed to the department in need of the supplies or material.

One of the immediate duties of any one issuing a requisition is to compare the copy of the purchase order with his numbered carbon copy of the original requisition, in order to check the purchase and possibly save delay incidental to errors in the purchasing department, or failure to thoroughly understand requisitions.

With such method carefully followed any failure in purchasing material or supplies can rightfully be attributed to dereliction on the part of the purchasing force, or to economic conditions of supply, demand, or transportation, for which no one may be held responsible.

Had such a requisition and such method of handling been in use in a certain Detroit automobile factory, there would have existed no need nor necessity for the purchase of an entire carload of upholstery tacks a few years ago when the purchasing agent found he could effect a considerable saving in price in carload lots. Many a factory would today be using a more durable and economical quality of leather belting, if price had not been the only factor considered by those in charge of the buying.

And while in most manufactured products the item of labor far exceeds in amount that of material, why should it not be of even greater importance that the purchase of labor be given at least the attention paid to requisitioning, purchasing, receiving and inspecting supplies and materials?

The usual practice followed is for the foreman of the department to interview applicants and to either accept or reject on the spot, in accordance with his own personal views, without any investigation, looking up of references or other means to assure him that he is not engaging a thief, a loafer, a labor agitator, or an otherwise objectionable worker. If, after a few days or weeks, information which could have been obtained before his engagement renders an employee objectionable for any reason, and his discharge seems advisable, a certain amount of harm, in most cases, will have been done, for summary discharge practically always temporarily disrupts, or at least causes disaffection and reduced production by those remaining.

At least one manufacturer, the custom by no means being common, displays on a bulletin board just before the noon intermission and the closing hour, and also before beginning work mornings and at noon, in the department where new men are to be taken on, the names

(Continued on page 20)



THE principal reason that cruisers built by us have a certain rare quality of elegance and completeness (which cannot be written into the specifications) is because we limit our work and study to the construction of cruisers of the highest grade.
A boat building organization which is prepared to take on all grades of construction finds it difficult to reach that single standard of work which is *our only standard*.
If our charges are sometimes slightly higher than those of other boat builders it is simply because we mean to build into a boat a quality superior to what most builders would consider necessary.
A critical inspection of a Great Lakes Craft would explain exactly what we mean, for our work must really be seen to be fully appreciated. We would like to send you the splendidly illustrated Picture-Book describing the Fifty-Foot Military Type Express Cruiser (refer to it as Bulletin No. 555-E) or, if you are interested in a smaller boat, Bulletin No. 222-E describes and illustrates the Forty-Foot Military Type Express Cruiser. Both of these boats are stock models, a number of which are always under construction at our plant.

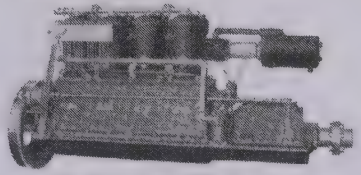
GREAT LAKES BOAT BUILDING CORP.
MILWAUKEE, WIS.

ABOVE *all* THINGS

own a dependable engine. Upon this characteristic of an engine more than any other depends your enjoyment or the success of your enterprise. Your boat builder, or perhaps your own desire for a fast boat, may influence you toward the purchase of a very light, high-speed engine, without regard to its dependable qualities.

A REGAL ENGINE

no matter whether it is in a commercial boat, cruiser or runabout, can be depended upon to go and keep on going. Substantial construction is not sacrificed to lightness, or reliability to power. An engine to be dependable must be capable of operating for long, continuous periods at its maximum rated power and speed. It must be in perfect order after such a run. These, above all, are the characteristics of Regal Engines.



REGAL GASOLINE ENGINE CO., 59 W. Pearl St., Coldwater, Mich.

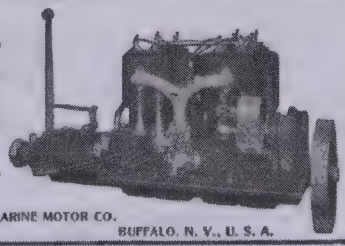


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"Imitated, but Not Equalled"
Fine mechanical features.
Honest power ratings.
Reasonable prices.
Manufactured by
C. L. BARKER,
Norwalk, - - - Conn.

BRENNAN STANDARD MOTORS
Medium and Heavy Duty, 16 to 100-H.P.
When you buy a Brennan Motor you get a complete outfit ready to run. The unusual size of the bearings, large valves and long stroke insure power and continuous service under all conditions. Very economical in fuel consumption.
Our New Model B Unit Power Plant is one of the finest engines ever produced. No expense has been spared in developing it to the smallest detail and we honestly believe its equal does not exist. Let us send you further details.
BRENNAN MOTOR MANUFACTURING COMPANY, SYRACUSE, N. Y.

PEERLESS ENGINES

4-cycle sizes 8 to 50 H.P.



PEERLESS MARINE MOTOR CO.
BUFFALO, N. Y., U. S. A.

Gasolene Yachts and Engines



Noted for Reliability

Tregurtha Water-Tube Boilers, Steam Engines, Electric Light Outfits

MURRAY & TREGURTHA CO.
340 West First St. South Boston, Mass.

Bei Bestellungen beziehen Sie sich bitte auf THE RUDDER

(Continued from page 18)

and other information obtained from applicants, with the request that any one who knows anything of any applicant, which should in any manner affect his application, either for or against him, convey such information to his foreman forthwith in confidence. This plan has prevented the employment of many objectionables, not a few such being radical anarchists.

* * *

STEAM YACHT IRENE SOLD

The fast, steel twin-screw steam yacht Irene has been purchased by Michael Dreicer, of New York, from Alfred P. Lasher, N. Y. Y. C., through Cox & Stevens, of this city. The Irene's dimensions are 155 ft. in length over all, 130 ft. waterline, 18 ft. breadth and has 7 ft. 6 in. draught. She is powered with triple expansion engines which drive her at a speed of 17-18 miles per hour on forced draught.

The owner's accommodations include dining saloon in forward deckhouse, social hall in after deckhouse, and five staterooms aft (all finished in white mahogany).

The yacht will be used on Long Island Sound and adjacent waters by her new owner during the coming season.

* * *

STAY-TITE

(Marine Caulking Cement)

This material is being used widely throughout the United States and Canada for caulking seams and checks and attaching canvas to decks. It requires no heating.

For below the water-line the black material is recommended and for above the water-line gray. Other colors may be furnished on special order. This material may be obtained from the Motor Boat Supply Company, 1415 W. 9th St., Cleveland, O. They will be pleased to mail circulars and give any information and answer any questions pertaining to this material.

This concern also carries a complete line of marine supplies and equipment. Their large handsome illustrated catalog will be mailed on receipt of 10 cents in postage to cover the expense of mailing.

* * *

NEW POSITION

A. H. Bartsch, for seven years advertising manager of the Bosch Magneto Company, is now associated with McLain-Hadden-Simpers Company, of Philadelphia and New York.

As secretary of the company Mr. Bartsch brings with him a broad, sound and *practical* merchandising and advertising experience, consistent with the high ideals upon which this organization was founded.

Mr. Bartsch, in his long and successful association with one of the oldest and strongest manufacturers, has enjoyed the privilege of being one of the important figures in the development of the automobile, motorcycle and allied industries.

Mr. Bartsch's association adds particular value to the services this company are already so successfully rendering to a list of clients in these industries—a service which they can now offer to a limited number of other manufacturers of similar but non-competing articles—motor cars, trucks, motorcyles, accessories.

They will explain this service to any manufacturer who takes his advertising seriously.

* * *

CHINGACHGOOK SOLD

The Navy Department has purchased Chingachgook, the Greenport scout boat which attracted so much interest at the Power-Boat Show. Preparedness is the watchword of the Greenport plant and they have immediately set down the keel for a new boat of this type for their own use this Summer in the Naval maneuvers.

The new boat will practically be a duplicate of the Chingachgook, except that she will be somewhat faster, inasmuch as the power plant will be somewhat larger. The new boat will be powered with two 6-cylinder, 6¾x7¾ Duesenberg Patrol Model engines, which will be turned at 1,250 r. p. m., developing approximately 240 h. p. each at this speed.

The Greenport Company are also building for Capt. J. J. Phelps a 72-ft. scout boat on the same lines, and the power plant will consist of two 8-cylinder, 6¾x7¾ Duesenberg Patrol Model engines, turning 1,250 revolutions, developing 350 h. p. at this speed, with a reserve of 75-80 h. p. in each engine, as they can be turned up to 1,500 when necessary.

It is also of interest to know that the Greenport Company have secured a contract from a foreign government for eight 72-ft. patrol boats, similar to the one they are building for Captain Phelps, and each one will be powered with three 8-cylinder Duesenberg engines, duplicates of those installed in the U. S. Navy submarine Swatter, built by this firm.

* * *

COMMERCIAL SHIPBUILDING

On Tuesday morning, February 20th, there was launched from the plant of the Hanlon Shipbuilding Company, of Oakland, Cal., the largest wooden sail vessel ever built. More than two thousand spectators crowded around the launching ways. Included among the spectators were city officials, representatives of shipping firms both American and foreign and of the builders. The vessel was sponsored by Miss Dorothy Pillsbury, daughter of Captain Pillsbury, of the marine underwriters. After the launching ceremonies were completed, Miss Pillsbury was presented with a handsome diamond brooch on behalf of the builders of the ship. This vessel, built to the order of the Western Fuel Company, and sold while under construction to a Norwegian firm, was to have been christened as the Faulkentind, but due to the President's order forbidding the transfer of American vessels to foreign registry, this sale was cancelled, the vessel reclaimed by her original owners, and, due to the uncertainty of the situation, Hanlon launched her simply as Hull No. 76, flying the Stars and Stripes, the name to be decided upon later, when it is decided who is to own her. The "76" is 271 ft. long, 47 ft. breadth, with a moulded depth of 26 ft. 6 in. Her keel was laid seven months ago, and her cost will be well over $200,000.

The hull of the new steamer, Ernest H. Meyer, launched January 20th, at Astoria, Ore., is preparing to leave for San Francisco in tow, to have her engines installed. She is to be powered with steam engines, being one of the very few steam powered of the smaller ocean freight vessels so equipped now.

The power schooner, S. A. Allard, which is to be equipped with engines of the semi-Diesel type, arrived in San Francisco recently in tow, her oil engines being here for her.

There has been a tremendous revival in shipbuilding along the Pacific Coast during the past two years. The semi-Diesel engine, first introduced on this coast by the Bolinders of Sweden, took the coast by storm, and probably a hundred sets of engines have been sold and installed of this one make alone. Others have entered the field since, and all have been given liberal support. One of these, the Skandia of Sweden, also, has, in the few months on this market, created such a tremendous demand that it has become necessary to build a factory in Oakland for their production on a quantity basis. It is predicted that this factory will in time be one of the largest in the world producing semi-Diesel engines for marine service. The Atlas Gas Engine Company, also of Oakland, is completing a large addition to their already very big plant, for the manufacture of their new Diesel engines. Several others have been announced, and Oakland will probably resemble the River Weir a few years hence, if the proposed shipyards materialize. In steel shipbuilding, San Francisco Bay leads the entire country. The Union Iron Works has, in Alameda, what is expected to become the greatest shipbuilding plant in the entire world. The largest plate shop ever built, costing something over $1,000,000, and over 900 ft. in length, is building now, and two building slips, each to accommodate a 900-ft. battle cruiser are being laid out, in addition to slips for the construction of a large fleet of destroyers, and six battleships of the latest type. This yard has an area of about 2,000 ft. waterfrontage, and is two miles deep, giving plenty of room for machine shops, foundries, forge shops, plate storage facilities, and all of the many others required by the largest shipbuilding plant in the world. This plant is controlled by the Bethlehem Steel interests, who announce that more than $20,000,000 will be spent in developments and improvements here during the next couple of years.

The greatest difficulty now facing the shipbuilders both of wooden and steel vessels is the securing of experienced men in the various trades required. The Navy Yard at Mare Island, California, is calling for all of the men to be had for work on the battleship California, now under construction there, and on other work going on. The other iron shipbuilders around the bay are also praying for men, and considering the mildness of the Western climate it would seem that more men would come from the Eastern coast. The weather in Summer never is too warm for safety out-of-doors, and in Winter is always such that men can work steadily. There will be no "lay-offs" for the next couple of years, possibly longer. Men skilled in these trades wanting to go West might write the editor of this magazine for full information as to who to communicate with on this coast for information as to positions.

Real WOLVERINE Power

The Motor with the Bore & Stroke

Fuel Cost Reduced

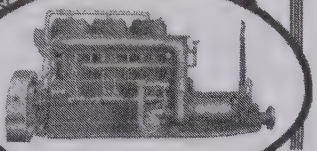
from 70 to 80% without sacrificing reliability, flexibility or control. Perfect combustion on Kerosene or lowest grade of Coast Distillate.

Sizes from 5 to 200 H. P.
1 to 6 Cylinders

Kerosene

The gasoline question has been solved by the

WOLVERINE MOTOR WORKS
Bridgeport, Conn., U. S. A.



RALACO MARINE ENGINES

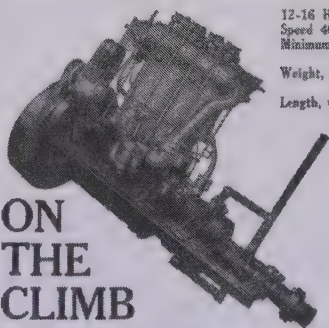
QUIET RUNNING STURDY CONSTRUCTION

ECONOMICAL IN OPERATION

(1/10 OF A GALLON OF GASOLINE PER H.P. HOUR)

10 TO 75 HORSEPOWER 2 TO 6 CYLINDERS

THE S. M. JONES COMPANY
604 SEGUR AVENUE TOLEDO, U. S. A.



12-16 H.P.
Speed 400-550 R.P.M.
Minimum Speed 150 R.P.M.
Weight, with Reverse Gear, 700 lbs.
Length, with Reverse Gear, 51¼ in.

ON THE CLIMB

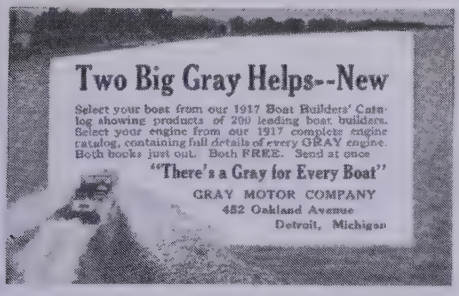
No matter what the position may be, or how choppy the seas, the Frisbie is always the Friendly Motor. It will bring you home.

It has that sturdy dependableness, with plenty of reserve power, whether it is nosing along through a treacherous channel or scudding home against a head wind and sea.

Test this by writing to users of Frisbie Motors. We will furnish you a list on request.

Frisbie builds a motor for every craft. One cylinder to six, 3 H.P. to 75 H.P.

The Frisbie Motor Co.
56 Cone Street Middletown, Conn.

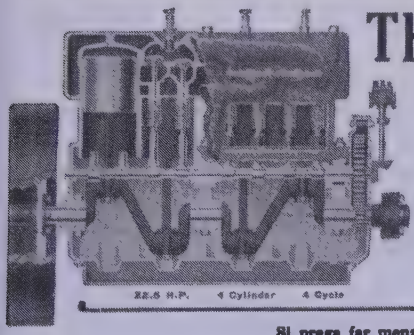


Two Big Gray Helps--New

Select your boat from our 1917 Boat Builders' Catalog showing products of 200 leading boat builders. Select your engine from our 1917 complete engine catalog, containing full details of every GRAY engine. Both books just out. Both FREE. Send at once

"There's a Gray for Every Boat"

GRAY MOTOR COMPANY
452 Oakland Avenue
Detroit, Michigan



22.5 H.P. 4 Cylinder 4 Cycle

The WONDER MOTOR

Same dimensions as Ford auto engine, the most efficient motor of its size ever built. All essential parts are **interchangeable with Ford parts,** which may be secured everywhere at small cost. All repair men are familiar with the Ford engine and will readily understand your Wonder Motor.

An ideal motor for family launch, runabout, or business boat. Improved lubrication. Atwater-Kent ignition, first-class carburetor. Write for full information.

We also manufacture a complete line of high-grade two-cycle engines from 3 to 90 h.p., including the famous Elbridge "Featherweight" engines for speed boats.

ELBRIDGE ENGINE COMPANY
334 East Main Street Rochester, N. Y., U. S. A.

PRICE
$245

YACHT SALES

The season in Florida this Winter has been unusually brisk; in fact, more sales and charters of yachts, houseboats, and power yachts have been made than in any other year, even more than last year, which was a banner one for the Southern resorts.

Messrs. Tams, Lemoine & Crane, who have been specializing Florida waters, report great activity in Southern yachting. The following yachts have been sold or chartered, all of them for use in Southern waters:

The 200-ft. steam yacht Surf, chartered by Mr. John H. Hanan, a well-known yachtsman, is now cruising in Florida.

The 3-masted schooner yacht Alcyone sailed for the Caribbean Sea with Mr. Henry W. Putnam on a cruise of about two-months' duration. The Alcyone is one of the largest schooners on this coast and was built from Tams, Lemoine & Crane's designs some years ago.

The 100-ft. power houseboat Ruffhouse has been chartered to Mr. T. L. Chadbourne Jr., for the month of December. Yacht was also chartered to Mr. Chadbourne for February, March, and April.

The 105-ft. houseboat Kama has been chartered for Mr. William Keyser, Jr., to Mr. F. C. Havemeyer, who will use her the entire season.

The Swordfish, chartered for Schuyler Schieffelin to Mrs. E. T. Stotesbury. She is now at Miami.

The twin-screw power houseboat Day Dream, which was chartered last Summer to Mrs. W. W. Sherman, of Newport, has been chartered by Mr. J. W. Minturn to Mr. Ambrose Monel, Jr.

Upon completion of Mrs. Stotesbury's charter of the Swordfish, she has been chartered to Mr. Stewart Duncan, who will use her at Palm Beach and Miami.

The houseboat Osiris has been chartered for Mrs. J. A. Ferguson to Mr. Rodman Wanamaker. It will be remembered that Mr. Wanamaker's 250-ft. steam yacht Nirvana was recently badly burnt at Brooklyn just prior to her going into commission for a Southern cruise. Mr. Wanamaker immediately chartered the Osiris to take the Nirvana's place, and shortly thereafter sold the steam yacht Nirvana to Mr. Walter W. Dwyer. The Nirvana has been repaired and sent South.

The houseboat Swordfish, upon the completion of Mr. Duncan's charter, has been chartered to Mr. Frederick F. Freylinghuysen and is on the West Coast.

The houseboat Day Dream has been chartered for the last part of the Winter to Mr. M. O. Wilson, who will join her at Miami.

The houseboat Beach Comber, which was chartered early in the season to Mr. Henry B. Anderson, who has already made a cruise on it, has been sub-chartered to Mr. Edward Browning, of Philadelphia. Mr. Browning will join the boat at Palm Beach.

The power yacht Drusilla, belonging to Mr. A. J. Drexel Paul, of Philadelphia, is now in Southern waters. She was chartered to Mr. Thomas W. Lamont.

The express cruiser Mystery has been sold for Mr. Ralph Pulitzer to Mrs. Peter Cooper Hewitt. The Mystery is well known in these waters, Mr. Pulitzer having used her as a ferryboat last Summer. She has a speed of about 28 miles per hour; is 58 ft. long; 200-h. p. Sterling engine. She was built from Tams, Lemoine & Crane's designs by the Gas Engine & Power Company last year.

The power yacht Manitee has been sold for the Gas Engine & Power Company, to. Judge R. W. Bingham, of Louisville, Ky. The boat has just been shipped South and arrived at Palm Beach a few days ago. The Manitee is a 55-ft. day cruiser with a speed of 15 miles per hour.

The sloop yacht Husla has been sold for Mr. C. A. Morss, of Boston, to Mr. Clinton H. Crane. The Husla is now at Ilseboro.

The 17-footer The Bird has been sold for Mr. Charles D. Dickey to Mr. Clinton H. Crane. The Bird is one of Ilseboro's 17-footers and will be raced by Mr. Crane next Summer. This is one of the most popular classes on the Maine Coast, there being some twenty boats in it.

The 45-foot cruiser Bettina has been sold for Mr. J. A. Coffin to Lee Gazley of the New York Y. C. The Bettina was shipped to Jacksonville on one of the Mallory boats and cruised to Bellaire, Fla., on the Gulf, where she is now being used by Mr. Gazley. He will use her in Northern waters next Summer.

The sloop yacht Husla has been sold for Mr. Clinton H. Crane to Mr. Charles D. Dickey and will cruise in Maine waters next Summer.

The 125-ft. twin-screw power houseboat Nirodha has been sold for Mr. William Gammel to Mr. Samuel Untermyer. The Nirodha is one of the most luxurious, shallow-draught houseboats now in Florida. Mr. Untermyer is cruising through The Keys on the yacht. She has twelve large staterooms and six baths; dining room, smoking room, sitting room, and observation rooms. The Nirodha is one of the best known of the larger houseboats built of steel.

The New York Y. C.'s 40-footer sloop yacht Dolly Bowen has been sold for Mr. Alexander Smith Cochran to Mr. Hendon Chubb. Mr. Chubb formerly owned the schooner yacht Queen Mab, which he raced so successfully last season. The Dolly Bowen will be raced during the Summer and should give a good account of herself.

The fast cruising power yacht Alert has been sold for Mr. Charles A. Stone to Mr. Thomas DeWitt Cuyler, of Philadelphia. Last Summer, Mr. Cuyler had under charter the 75-footer Wilrose. The Alert is well known on the coast and was designed by Tams, Lemoine & Crane a couple of years ago. She has been chartered to Mr. Pembroke Jones at Newport and was for a time last Summer chartered to Mr. C. Oliver Iselin. Mr. Cuyler will use the boat at Bar Harbor.

The power boat Carnwath has been sold for the Estate of the late Senator N. W. Aldrich to Mr. Isaac Untermyer. The boat has just been shipped to Palm Beach, where Mr. Untermyer is using her now. He will use her next Summer on the Hudson and at Narragansett. The Carnwath has a speed of 20 miles an hour and is built of mahogany.

* * *

CHANGE IN ADVERTISING MANAGER

Mr. Alfred H. Bartsch, who has been advertising manager of the Bosch Magneto Company for seven years, resigned March 5th to become a member of the firm of McLain-Hadden-Simpers Company, Advertising and Merchandising Council, of Philadelphia and New York.

Robert S. Westcott, who has been assistant advertising manager of the Bosch Magneto Company for the past seven years, will immediately assume the duties of advertising manager, and will serve in that capacity at the present advertising offices of the company, 1764 Broadway, New York.

* * *

LARGEST ORDER

The Loew-Victor Engine Company have secured the largest contract placed at one time for high speed engines.

We are reliably informed that they have just closed a contract with a foreign government, after very thorough tests of their engines, for forty-two of their 8-cylinder, 6¾x7¾, 275-400-h. p. Duesenberg Patrol Model engines. They have previously supplied this government with a small number of machines, each one passing through a severe test, consisting of a 5-hour run at maximum, then run at one hour at speeds ranging from 800 to 1,500, followed up by a very severe backing test, all engines coming through with a perfect score, in the presence of that government's representatives.

This particular 8-cylinder Duesenberg Patrol Model engine sells for $6,250, so it appears that this contract in dollars and cents is the largest that has ever been placed for high-speed marine engines.

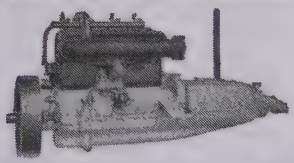
New York Yacht, Launch & Engine Works are building from designs of Tams, Lemoine & Crane a 55-ft. scout boat for Mrs. Armour Ferguson. This boat will be powered with a 6-cylinder, 6¾x7¾, 200-300-h. p. Duesenberg Patrol Model engine.

* * *

OFFICERS OF NATIONAL ASSOCIATION OF ENGINE AND BOAT MANUFACTURERS

At the March meeting of the Executive Committee of the National Association of Engine & Boat Manufacturers, held at the Engineers' Club, 32 W 40th St., New York City, the following officers were reelected for the ensuing year: President, John J. Amory, of the Gas Engine & Power Company and Chas. L. Seabury & Co., Consolidated, Morris Heights, New York City; 1st vice-president, Henry R. Sutphen, of the Elco Company, Bayonne, N. J.; 2d vice-president, Percy C. Jones, of the S. M. Jones Company, Toledo, Ohio; 3d vice-president, Charles A. Criqui, of the Sterling Engine Company, Buffalo, N. Y.; treasurer, James Craig, of the James Craig Engine & Machine Works, Jersey City, N. J.

Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE



The 1917 Unit Power Plant Model "F" THOROBRED 26-36 H.P. 4 1-16 x 5 in. Furnished with or without Unit Power Plant.

Try to Buy a Thorobred

Go into the market for a used motor and see how many Thorobreds are offered. If by chance you find some for sale note well the price quoted you—which is a plain gauge of the value placed by its owner.

There's no better test of the satisfying qualities of a marine motor.

Every Thorobred owner knows his Thorobred is just as good after two or three years' use—and just as valuable—as when he bought it new. And he won't sell it for much less.

If you seek satisfaction for 1917 write us about your requirements.

14 to 40 H.P.

"Thorobreds" Burn Kerosene, if desired.

RED WING MOTOR CO. Dept. R. RED WING, MINN., U. S. A.

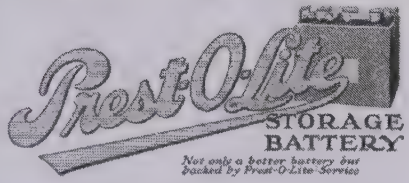
ALWAYS READY



DAY OR NIGHT

"Always ready" means "They always *work*" whether temperature hovers around zero or hits a hundred in the shade. And not only for a few months when new, but year in and year out; in short, *a Leece-Neville System is always on the job.*

THE LEECE-NEVILLE COMPANY
CLEVELAND, OHIO

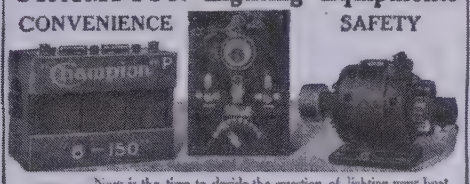


Not only a better battery but backed by Prest-O-Lite Service

A Correct Size Battery for Every Boat
Starting, Lighting and Ignition Types

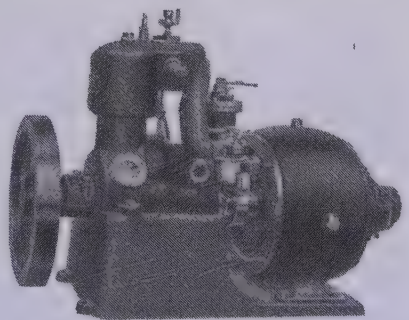
The Prest-O-Lite Company, Inc.
243 Speedway Indianapolis, Ind.

CHAMPION Lighting Equipments
CONVENIENCE SAFETY



Now is the time to decide the question of lighting your boat for the coming season. The "Champion" is the pioneer in this line. Outfits for all sizes of cruisers.
You will find our catalog interesting.
Hector MacRae, 316 St. Paul St., Baltimore, Md.

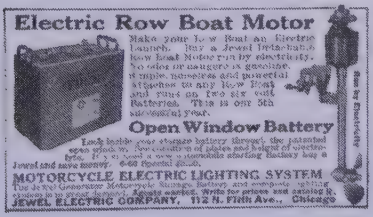
Yacht Lighting Outfit



A HIGHLY developed direct-connected Generator Set. Used on some of the finest yachts built during the past few seasons. Nothing like it in existence, for those wishing a compact and reliable plant, suitable for yachts from 40 to 80 feet, operating interior, running lights, electric fans, searchlights, etc. The air compressor may be used for whistle, air pressure on water tanks, or supplying air pressure for starting engine. Used by U. S. Government on scout cruisers. ¶ Let me send you a few Light facts.

R. S. MILLS, 173 Lexington Ave., Brooklyn, N. Y.

Electric Row Boat Motor



Make your Row Boat an Electric Launch. Buy a Jewel Detachable Row Boat Motor run by electricity. No odor or danger as gasoline. Simple, noiseless and powerful. Attaches to any Row Boat and runs on two six volt Batteries. This is our 5th successful year.

Open Window Battery

Look inside your storage battery through the patented open glass top. See condition of plates and height of electrolyte. Add water when necessary. Automobile starting battery has a Jewel and saves money. Send special plans.

MOTORCYCLE ELECTRIC LIGHTING SYSTEM

The Jewel Generator Motorcycle Storage Battery and complete lighting system is in great demand. Agents wanted. Write for prices and catalog R.

JEWEL ELECTRIC COMPANY, 112 N. Fifth Ave., Chicago

Koukokusha ni otegami onsashidashi no saiwa dor o RUDDER nite goran no mune onkakisoe negaimasu

NOTED FRENCH DIRIGIBLE BUILDER

Henri Julliot, the French engineer and builder of dirigibles, is deep in the work of constructing the two huge Blimp type non-rigid dirigible balloons which are being built for the Government by The B. F. Goodrich Rubber Company, where he has accepted the commission as chief of the Goodrich Aeronautical Division.

Unusual importance is attached to M. Julliot's presence in the United States at this time, for he brings with him the greatest fund of dirigible building knowledge that is available to any government, and as chief of this important division of the Goodrich Company, he is putting forty years of study and practical experience behind the great organization of which he has become such a prominent figure.

Since the beginning of the war, M. Julliot has acquired the title of the "Super-Zeppelin" of France, for his experience and activity in dirigible building predates that of the late Zeppelin, of Germany, by many years. His aeronautical experience dates back almost forty years, when he was first associated with Messieurs Lebaudy freres in their immense sugar refineries, as Directeur of Technique. In this capacity, in the early 70's, he built the famous Lebaudy dirigible for his employers, who were interested in ballooning as a sport.

The success of the first Lebaudy type encouraged Julliot so much that he devoted a large portion of his time to the further development of dirigibles. While he still continued as Directeur of Technique at the Lebaudy refineries, his employers gave him ample financial assistance to enable him to carefully work out the present type of non-rigid dirigible. In 1899 he began building this type of aircraft for military purposes, but it was not until 1902 that he felt he had made the non-rigid dirigible practical for military use. While he has never at any time confined his labors entirely to the French Government, nevertheless France has always had his valuable aid and counsel.

It was not until two years ago, following a visit to the Goodrich factories here in America, that Julliot saw the possibilities of his dirigibles in their adaptation to military use by the United States Government. With the foresight and determination so characteristic of his people he returned to France, where he lived practically the past two years in observing all types of aircraft and the success with which they were used by the Allied governments. He also acted in an advisory capacity to the French Government during this period. It was but little more than a month ago that he received the opportunity he had so long awaited, to head the Goodrich Aeronautical Department.

The present order for two of the Blimp type non-rigid dirigibles is being supplied under the personal direction of M. Julliot. This was the total number recently bid upon by the Goodrich Company, but now with the complete organization with which M. Julliot has surrounded himself, the facilities will permit of larger numbers being built in the near future in accordance with the acceptance of the offer of the entire Goodrich resources by the United States Government.

The shape of the envelope of the Blimp dirigible somewhat resembles that of a cigar. The entire length, from tip to tip, will be 160 ft. and the maximum diameter 31.5 ft., but the maximum width over the tail fins will be 36.2 ft. This huge envelope will displace 77,000 cu. ft.

Suspended from the envelope will be a rigidly built car, spacious enough to carry a pilot, an observer, the necessary accessories for determining altitude, speed, etc., and a 100-h.p. gasolene engine of the latest improved type. Provision is also made for carrying ballast, which, when thrown out, will enable the dirigible to reach an altitude of 7,500 ft. with safety. These dirigibles are to be so constructed that the maximum speed of 45 miles per hour is attainable at an altitude of 600 ft., and this speed may be maintained for 10 hours. They can also endure 16 hours of flying at the cruising speed of 35 miles per hour, which permits a range of 560 miles.

In spite of all of these accomplishments, one of these air giants weighs but 5,275 lb, and this includes even the weight of the pilot and observer and their equipment. The total weight of ballast is only 601 lb, 390 being water and 211 lb of sand. This total weight of 5,275 lb is divided by the Government engineers into two classes, known as "penalty weight," and "useful load." The first mentioned covers only the dirigible and its mechanical equipment, which is specified at 3,334 lb. The "useful load" includes the pilot and observer, their instruments, radio, fuel, oil, and water, together with the sand and water ballast, and the maximum weight of this is set at 1,941 lb.

DUESENBERG MOTORS CORPORATION

One of the most interesting events of the more recent past is the formation of the Duesenberg Motors Corporation, of New York City, with a cash capital of $1,050,000 fully paid in. The new corporation succeeds and takes over the business of the Loew-Victor Engine Company, of Chicago, and the Duesenberg Motors Company, of St. Paul. It will build on a commercial scale the highly efficient engines designed by Fred S. Duesenberg for marine, automobile and aeroplane service. A number of contracts already have been closed with some of the most prominent builders of high-class power boats, automobiles and aeroplanes, and production is already organized on quite a large scale. The engines manufactured by the Duesenberg Motors Corporation are essentially for those who can afford and demand the best. In each instance they are high-powered, high-speed and high efficiency power plants, and already a number of well-known yachtsmen, etc., have purchased Duesenberg engines for installation in their power boats, patrol boats and seaplanes.

The marine models of the Duesenberg engines were brought out nearly two years ago by the Loew-Victor Engine Company, of Chicago, and have been in successful operation for some time, and the volume of business on these engines has been large for better than a year, and it is now one of the biggest factors in the marine engine industry. These marine engines are made in two sizes, a 6-cylinder, 6¾ by 7¾ in., and an 8-cylinder, 6¾ by 7¾ in., developing from 200 to 400 h.p. These two engines will be manufactured in the Chicago plant of the Duesenberg Motors Corporation, and this plant will do nothing else but produce these marine engines.

The automobile and aeroplane engines manufactured by the corporation are now being built at the new plant located at Edgewater, N. J., this plant having been recently taken over, it previously being one of the big munition plants at Edgewater. Consequently its equipment was almost ideal for the manufacture of engines of the Duesenberg type, and it was only necessary to make a very few changes in the machinery and equipment of this plant to make it a highly efficient unit for the purpose desired. Manufacturing is now going on at the Edgewater plant, and production is rapidly climbing to the point where it will be possible to at least fill the immediate orders that the corporation has booked.

The stockholdership of the Duesenberg Motors Corporation is in the hands of some of the best known men in business and financial circles of the United States. The officers of the new corporation are as follows: President, J. R. Harbeck; assistant to the president, E. P. Decker; secretary and treasurer, H. A. Wing; vice-president, Charles Stollberg; general manager in charge of manufacturing, Charles B. Page; general sales manager, N. G. Rost; purchasing agent, G. N. Beilstein; chief engineer, F. S. Duesenberg; assistant engineer, A. S. Duesenberg; assistant engineer and naval architect, Morris M. Whitaker; assistant engineer, specializing in aeronautical division, F. G. Robinson.

From this list it will be seen that the corporation already has established a highly efficient organization, made up of men thoroughly experienced in the various lines.

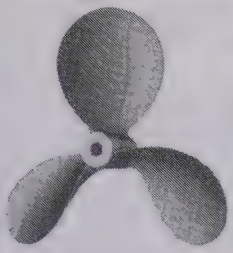
The board of directors of the Duesenberg Motors Corporation is as follows: J. R. Harbeck, F. S. Wheeler, Charles Stollberg, Karl Breckenbridge, L. E. Welles, Frank B. Page.

Mr. J. R. Harbeck has been president and managing director of the Loew-Victor Engine Company for the past three or four years, and it was under his active management that the Duesenberg engine was developed for marine and aeroplane purposes. Mr. Harbeck will devote even more of his personal time and attention to the affairs of the Duesenberg Motors Corporation than he even did to those of the Loew-Victor Engine Company.

Each of the three types of engines will be built on the same general design, differing only enough to adapt them to their individual requirements. The Duesenberg design has proven itself in actual service for a number of years. Better than 60% of all racing cars on American speedways in 1916 were equipped with Duesenberg engines. Duesenberg engines were installed in the first power boat to make a mile-a-minute speed. Duesenberg engines were installed in the boat that won the displacement runabout classic at the Miami regatta this year. Duesenberg engines are installed in seaplanes now in the service of the United States Navy.

The Duesenberg 4 and 6-cylinder automobile engines simplify the evolution of the Duesenberg design, which has passed through the severe test of automobile and power-boat racing.

(Continued on page 26)



HYDE

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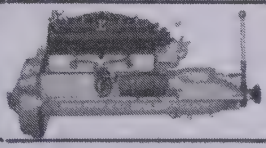
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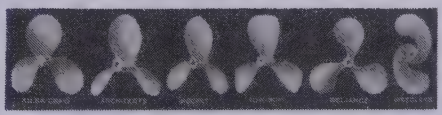


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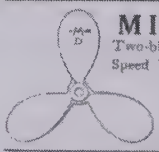


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(Continued from page 24)

and now occupies a dominant position in the field of internal-combustion engine design.

The racing game has refined this design to a hitherto unattained degree. It has made it possible to build an engine developing more power in proportion to bore and stroke than any other engine in America. The weight, however, has been kept well within the necessary limit, and the engines are wonderfully compact.

The Duesenberg design as applied to automobile and aeroplane engines has been worked out in full detail, and put on a commercial and manufacturing basis, and the plant at Edgewater, N. J., is now producing these engines and is now in a position to accept and efficiently handle large orders.

* * *

THE GRAY MOTOR COMPANY PREPARED FOR ANY EMERGENCY

When the coal famine recently threatened the city of Detroit and surrounding territory, it began to appear as though many of the large industries in that locality would have to cease operations on account of lack of electric power to run their plants. However, the Gray Motor Company, of Detroit, were equal to the emergency. They adapted their 4-cycle, 12-15-h.p. Model "F" and 4-cycle, 20-24-h.p. Model "D" engines to furnish power for the running of machinery formerly run by electric current.

Many of the large concerns in the vicinity of Detroit, who learned of the Gray engine's adaptability as a power transmitter, protected themselves against having their plants shut down by purchasing Gray engines to run their machinery.

During the past few years Gray engines have also been adapted for use as binder engines and many other applications and were found to be highly successful.

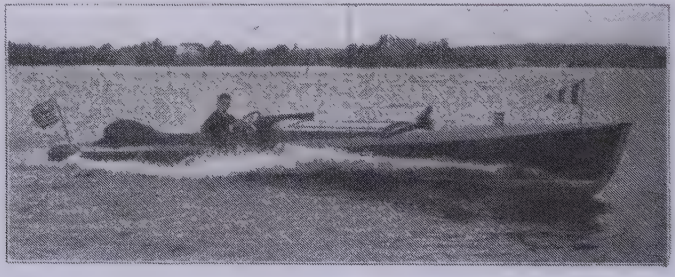
* * *

"BEAUTIFUL ISLE OF SOMEWHERE"

There are a lot of islands on the beautiful St. Lawrence River. They sure were "landscaped by the æons and hedged with romance," too.

It's Earth's garden spot where tired business men, regular fellows and the Upper Ten all mingle in the Summer in enjoyment of the magnificence of nature.

The Thousand Islands are famous the world over, and naturally power-boating is one of the greatest recreations; in fact, one cannot be in it without a power boat, for most of the homes are located upon the islands and a boat is necessary to reach the mainland.



All this leads us up to our story of the beautiful 28-foot runabout recently turned out by Hutchinson Brothers, of this district, for Stephan Bonsal, of New York City. This craft, shown in the accompanying illustration, has the remarkable speed of 26 miles an hour. Her power plant is a Model F, 28-36-h.p. Red Wing Thorobred, manufactured by the Red Wing Motor Company, of Red Wing, Minn. The performance of this boat speaks mighty well not alone for her power plant, but for the designers and builders of the craft, for 26 actual miles an hour with a runabout of this type, even with the best engine of 28-36 h.p. it is possible to build, leaves a great deal of credit remaining for her designers and builders.

Mr. Bonsal spends his Summers at Alexandria Bay, the hub of the Thousand Islands, and his Summer home is popularly known as the "Beautiful Isle of Somewhere" because, as the owner of the boat says, he gets somewhere every time he opens the throttle.

FIFTY THOROBREDS FOR FINLAND

Fifty kerosene burning Red Wing Thorobreds will soon be shipped to Finland, where the economy of kerosene burning is a condition upon which engines are purchased. Of these twenty are the Model A, ten Model AA, and twenty Model F. The engines are to be complete with all equipment ready to install in the boats.

The kerosene burning feature of the Red Wing Thorobred is making it immensely popular in the Scandinavian countries, where large numbers of them are already in operation. The Red Wing kerosene burning attachment is one of the most efficient yet devised and by its use hundreds of Thorobreds are doing every day duty in many foreign lands on kerosene, and even low grades of distillate.

The Red Wing Motor Company, already one of the largest American marine engine manufacturers, has added many new modern facilities at its big plant at Red Wing, Minn., and a trip through the factory where every part of these famous engines is made, is a good demonstration of the wonderful advances in methods and construction in the larger plants of the country.

* * *

THE NEW GRAY COMPLETE CATALOG

An exceptionally attractive catalog of marine engines is the one just turned out by the Gray Motor Company, of Detroit, Mich. The catalog consists of a 32-page book, printed in two colors, and profusely illustrated.

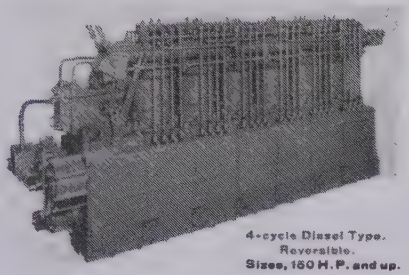
The book describes the well-known Gray efficiency methods of manufacture and then takes up each engine of the Gray line in detail.

The Gray line at present consists of both 2 and 4-cycle engines, the Model "U" 2-cycle machine being made in four sizes, as follows: Single cylinder 3 h.p., single cylinder 5½ h.p., double cylinder 6 h.p., double cylinder 11 h.p. These engines are sold with complete outfits for either fresh or salt water and the prices are exceedingly attractive.

The Gray 4-cycle line is becoming better and better known on account of the remarkably good results which Gray 4-cycle engines are giving in boats in which they are installed in all parts of the country and in every country in the world. The well-known Model "F" 12-15-h.p., 4-cycle, 4-cylinder Gray is prominently featured in the new catalog with a double page center spread, followed by two pages of more technical descriptive matter with specifications, installation diagram, lubrication diagram, and prices with accessories. This engine has been adopted by the Gas Engine & Power Company and Chas. L. Seabury Company, Consolidated, as the most suitable engine for their 16-ft. Speedway yacht tender, and the Gray Company report orders for about a dozen of these engines for these high-grade yacht tenders.

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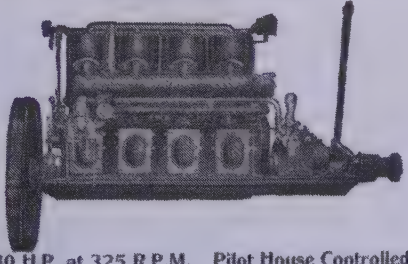
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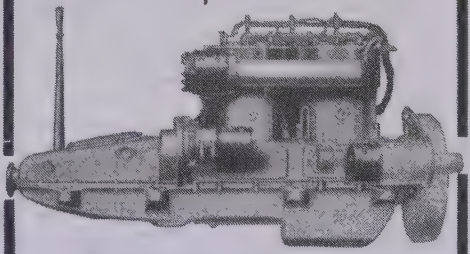
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Designing of Marine Gas Engines

By Chas. Desmond

PART VI

(Continued from May Rudder)

IN this chapter I propose to explain formula which are applicable to medium-speed marine engines, and I will set them down in such a manner that anyone having a fair knowledge of the rules governing the setting down of mathematical formula can understand and use them.

There is one thing you must remember when making use of formulas of the kind I explain. They must be used intelligently. The coefficients and figures given have been selected with care and will be found accurate for use when designing engines of proportions and types I refer to. For engines of other types slight changes in figures may be necessary.

Formula No. 1.

To Determine the I.H.P. of a Gas Engine

When calculating the I.H.P. of a gas engine four things must be considered:

1st.—The mean effective pressure per square inch of piston during the pressure stroke.

2d.—The area of piston head in square inches.

3d.—The length of stroke in feet, or parts of a foot.

4th.—The number of impulse strokes per minute.

The product of these factors divided by 33,000 gives the I.H.P. per cylinder. (See explanation in Part II.)

Set down as a formula the problem is:

$$\frac{P \times L \times A \times C \times E}{33{,}000} = \text{I.H.P.}$$

P=Mean effective pressure.

L=Length of stroke in feet.

A=Area of piston head in square inches.

C=Number of cylinders.

E=Number of impulses in one cylinder per minute.

Substituting figures taken from the preliminary sheet in Part IV and assuming that the net mean effective pressure is 65 lb, which is a safe figure to use for a medium-speed engine of the type under consideration, we get:

$$\frac{65 \times .458 \times 19.63 \times 1 \times 500}{33{,}000} = 8.85 \text{ I.H.P.}$$

and assuming that 70% of the I.H.P. is delivered at flywheel (a fair proportion), the preliminary calculation indicates that an engine of the selected dimensions will develop sufficient power in cylinder to deliver the desired H.P. at end of crank shaft under ordinary and average conditions of service.

I.H.P. of $5 \times 5\frac{1}{2}$=inch engine turning 500 r.p.m. = 8.85
B.H.P. estimated at 70% of the I.H.P. = 6.181
Desired H.P. 5 + 20% = 6.

You will note that the B.H.P. figures work out close to those given in B.H.P. table in April issue. These figures are fairly accurate ones for a two-cycle marine engine having moderate compression and turning up about 500 r.p.m. To get *exact* figures it is necessary to ascertain the *exact* mean effective pressure, which can only be done after engine is built, by attaching an instrument called an indicator to cylinder, taking an indicator diagram (tracing) when engine is running at its full power and measuring it either by ruling ordinates at right angles to base line of indicator diagram and ascertaining the average length, or by measuring diagram with an instrument called a planimeter.

Explaining the Meaning of Mean Effective Pressure

The term mean effective pressure means the average pressure brought to bear upon piston in engine cylinder during the working, or impulse, stroke less loss, if any, during idle strokes. When pressure is exerted on the piston head of a gas engine the piston moves in a direction perpendicular to its face and the work done in moving the piston equals $P \times A \times L$.

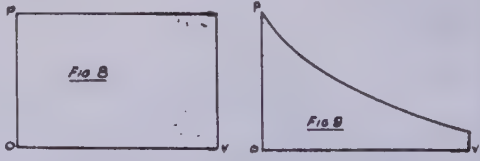
P=Pressure per unit of piston head.

A=Area of piston head.

L=Length of stroke of piston.

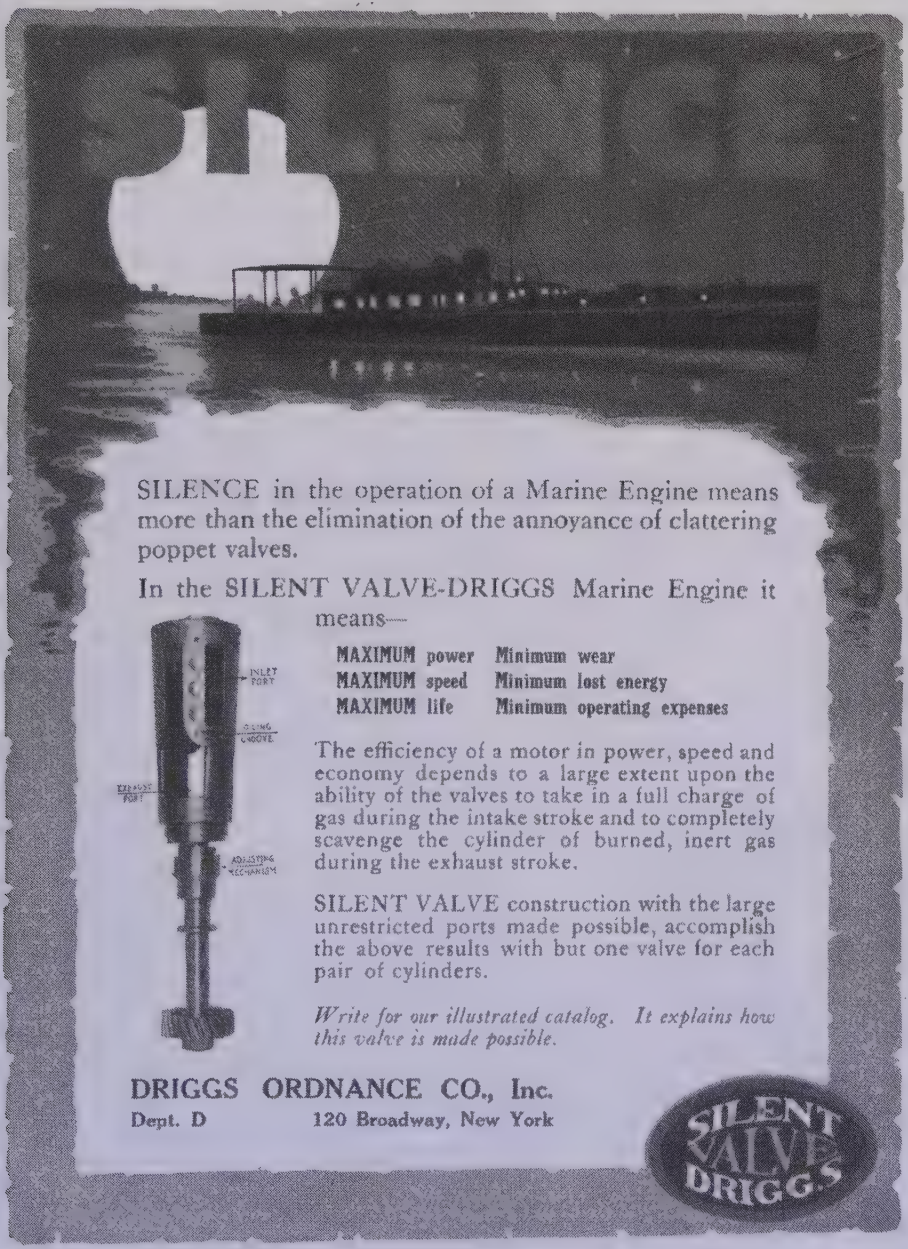
And, of course, the product of $A \times L$ = Volume swept by head of piston.

Fig. 8 is for the purpose of explaining this graphically.



Explaining Fig. 8.—I will assume that the horizontal line O V represents cylinder length measured from lowest point piston head reaches on its down movement to highest point it reaches on its up travel. Then the line O V represents stroke of engine. Now I will assume that compressed gas is ignited and exerts a constant pressure on piston head during the whole of its movement from O to V; then if the line O V is drawn to proper scale and assumed to represent volume swept by face of piston and a line O P is drawn to represent pressure the product of OV × OP, expressed in accordance with scales and volume selected, will express the energy exerted on piston during one impulse movement, and this energy can be graphically represented for constant pressure by drawing a line from P parallel to OV and another from V parallel to OP and forming a rectangle. And if the area of this rectangle is measured the measure-

(Continued on page 12)



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SILENT VALVE DRIGGS

(Continued from page 10)

ment will accurately express the work or energy transferred from the gas to the piston.

But if the pressure varies (and it does in actual practice) during the impulse movement of piston, then the graphical illustration of pressure line will be in the form of a curve shaped somewhat like the curved line shown by Fig. 9. And, of course, the area enclosed by this curved line will also graphically express work done and the average of pressure ascertained by measuring area enclosed by curved line and lines POV will be the M.E.P. of impulse stroke.

In making the above explanations I have considered pressure during only one, the working or impulse, stroke of a gas engine, but inasmuch as there is a working and an idle movement of piston in a two-cycle engine, and one working and three idle movements in a four-cycle, it is evident that actual power cannot be measured without considering idle as well as working strokes. So before the actual (net) M.E.P. can be ascertained, a diagram must be made of one complete cycle of operations (four movements of piston in a four-cycle engine, or two if engine is a two-cycle one).

A diagram of the pressure exerted on piston during the four movements mentioned is termed an indicator diagram.

Explaining an Indicator Diagram

Fig. 10 illustrates an ideal, or theoretically perfect

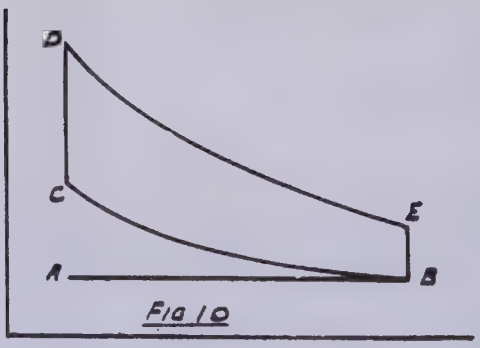


FIG 10

four-cycle gas engine indicator diagram. I have selected a four-cycle diagram because the lines on it can be more easily followed in a preliminary explanation like this than those of a two-cycle one. At the proper place I will fully explain and illustrate indicator diagrams of both types of engines.

When the suction, or intake, stroke begins the tracer point of indicator is at A, and if gas enters cylinder without friction and at constant pressure the indicator would draw the straight line AB, because under these conditions pressure would not vary during the suction stroke. The point B indicates ending of intake stroke, and during the up compression stroke the tracer arm would draw the line BC, the upward curvature of which will vary with increase of pressure during the stroke. The point C indicates end of compression stroke and the moment of ignition, and as the spread of flame is, theoretically, supposed to be instantaneous the line that represents rise of temperature and pressure during ignition period is shown by straight vertical line CD. During the down impulse stroke the line DE is drawn, and as the gas (theoretically) expands without gaining or losing heat the line shows a constant and gradual drop until point E is reached, when exhaust valve opens and, as the gas is supposed to pass out without friction, the pressure falls instantly to that of B, thus completing the cycle movements. But this theoretical perfection is never obtained, because there is always friction of both incoming and outflowing gasses, heat losses to cylinder walls, imperfections of ignition, etc. Fig. 11 shows an average four-cycle indicator diagram, and for the purpose of aiding you to note the loss due to abovementioned causes I have marked on it, in dot and dash lines, the outline of theoretically perfect diagram Fig. 10.

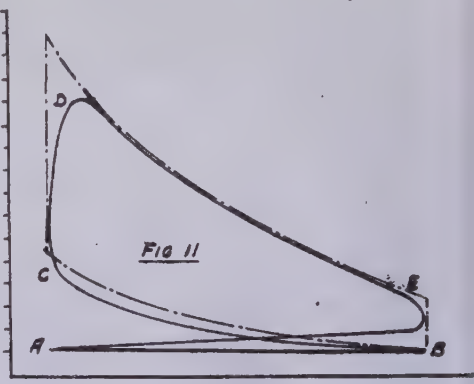


FIG 11

The point A on Fig. 11 is the beginning of intake stroke, but friction of incoming gas "wire draws" the charge to such an extent that actual pressure in cylinder at end of this stroke is often less than atmospheric. Often the line from A to B shows a decided drop. The compression line from B to C does not rise as rapidly as that on the theoretical diagram, because heat is taken up by cylinder walls and this loss shows in decreased pressure and temperature along the line. Ignition occurs at C, but here again the theoretical instantaneous ignition does not occur and the ignition period is shown by the slightly curved and inclined lines from C to D and the rounding of corners. The expansion line D E also shows some loss, because heat is given up to cylinder walls and ignition is never complete.

The exhaust valve opens at E, and as the gas has to force its way out of cylinder the straight drop EB of the theoretical diagram becomes the partially curved and partially straight line from E to A. The area of the upper portion, or loop, of a diagram like this represents energy that acts to drive the piston, and is termed the positive area. The area of the lower portion, or loop AB, represents energy expended negatively, or retarding energy, and may be termed the negative area and when measuring a diagram it is always necessary to deduct the area of negative loop from that of positive loop before calculating the effective energy or the mean effective pressure.

(Continued on page 14)



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Now owned by the United States Navy, originally designed and built for Harold S. Vanderbilt, Rear Commodore New York Yacht Club, now a member of the Naval Reserve of the Second Naval District.

This is a 72' x 12' 6" patrol boat expressly designed for the work required of it. Powered with a pair of eight-cylinder 400-H.P. Duesenbergs, it probably is the most efficient unit at present in the reserve fleet. The power plant in this boat has given an exceptionally good account of itself and gives the boat the speed required and splendid manœuvering ability.

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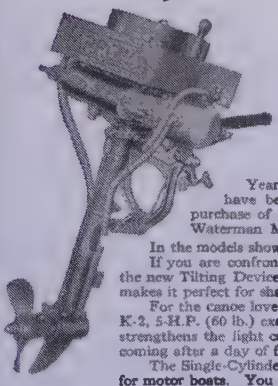
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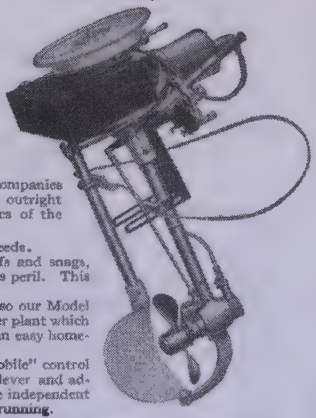
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(Continued from page 12)

FORMULA No. 2.

COMPRESSION PRESSURE AND CLEARANCE

When designing a marine gasolene engine of any type one of the first things to determine is the compression pressure, and as this depends very largely upon the amount of clearance given between piston and cylinder when piston is up and the ratio that volume of this clearance bears to the volume when piston is in its extreme down position, I will explain the meaning of these terms, how to determine clearance and what compression and explosive pressure can be obtained with named clearance percentages. Knowing these things you can quickly select a suitable clearance and compression to use.

When a charge of mixed gas and air is drawn into the cylinder of a gas engine the piston is at its lowest point and the inflowing gas (assumed to be at atmospheric pressure, about 14.7 lb absolute or 0 lb gauge) fills the cylinder completely. (See Figs. 2 and 5.)

NOTE.—In practice a full cylinder of explosive mixture cannot be obtained, because there is always a portion of residual gas left in cylinder from previous stroke, and certain fundamental defects in ports, or valves, in intake pipes and in mixing devises hinder the free flow of gas to some extent. But in calculations of this kind it is correct to assume that a cylinder full of mixture enters and to make a proper deduction from final figures to compensate for the loss due to things mentioned.

The space occupied by volume of charge when piston is fully down I will designate as V. As piston ascends the gas in cylinder, being held there by closing of port openings, or valves, is compressed and forced to occupy the small space left between piston and cylinder head when piston is at its highest point. This space I will call VI. The space swept by piston in its upward movement I will term the piston displacement. This compression of gas causes a rise in both temperature and pressure, the rise being in proportion to the ratio that piston displacement bears to VI (clearance).

(See remarks about laws of compression given on page 14, April issue of THE RUDDER.)

In marine gasolene engine practice compression varies from 55 lb to 95 lb gauge. For engines of the type and size I am dealing with compression should be between 63 and 75 lb gauge.

Clearance is generally expressed as a percentage and the percentage of clearance can always be ascertained by making this short calculation.

$$\frac{\text{Volume of compression space}}{\text{Piston displacement}} = \text{Percent. clearance.}$$

And knowing the percentage of clearance the compression pressure in pounds can be ascertained by referring to tables of pressures of which the following is one:

CLEARANCE, PRESSURE AND M.E.P. TABLE

% Clearance	Gauge pressure lbs.	Explosive pressure lbs.	Theoretical M. E. P. lbs.	Average M. E. P. lbs.
20%	105	352	95	76
22½	90	300	90	72
24%	79	261	85	68
25%	76	251	84	67
27%	67	219	79	63
29%	59	191	76	61
30%	57	184	75	60
32%	51	163	73	58
33%	49	156	71	57
35%	45	142	70	56
36%	45	130	64	51
37%	39	121	67	54

EXPLANATION OF TABLE

In column No. 1 is entered the % of clearance.

In column No. 2 is entered gauge pressure when gas is compressed to named %.

In column No. 3 is entered gauge pressure of explosion when gas is ignited.*

In column No. 4 is entered theoretical M.E.P. figures for named pressure.

In column No. 5 is entered average M.E.P. figures taken as 80% of theoretical.

To illustrate the way to use figures taken from this table I will make a calculation to determine required clearance and resulting pressures for engine I am designing.

In my preliminary power calculation I assumed that the M.E.P. is 65 lb. To obtain this gauge pressure of about 72 lb is required, and this can be obtained by having a clearance space of about 26%. Therefore, the clearance space required must equal 26% of piston displacement and with this amount of clearance,

The gauge pressure will approximate 75 lb.
The explosive pressure will approximate 240 lb.
The theoretical M.E.P. will approximate 81 lb.
The average M.E.P. will approximate 65 lb.

And these are the figures I have selected for the engine.

FORMULA No. 3.

THICKNESS OF CYLINDER WALL TO USE

The thickness of cylinder wall necessary depends upon the stress which can be safely allowed for continuous service. Marine gas engine cylinders are cast out of a good quality of iron and have water jacket as a part of the casting, therefore, the stiffening action of jacket metal must be taken into consideration and allowed for either by using a lower factor of safety for determining the working stress of cast iron, or by making a deduction from the final thickness figures.

Consider the maximum explosion pressure as being 3.5 times the compression pressure, the safe working stress of the cast iron at 3,200, and the supporting value of water-jacket portion of casting as being equal to ⅛ inch of metal, then the formula is:

$$\frac{P\ D}{S} - \text{⅛ inch} = \text{Thickness of wall necessary.}$$

P standing for maximum explosive gauge pressure.
D standing for diameter of piston.
S standing for allowable stress per square inch.
Substituting figures, the calculation is:

$$\frac{240 \times 5}{3{,}200} - \text{⅛ inch} = .250 \text{ inch thickness.}$$

And this is the thickness of wall required.

This formula does not allow surplus metal for reboring; in fact, it is not usual to make an allowance for this in marine gas engine practice.

Thickness of Jacket Wall.—The jacket wall should be made as thin as it can be cast. This will approximate ⅛ inch in an engine of this size when cylinder is cast in a small foundry.

Water Space Between Cylinder and Jacket Walls.—This should be proportioned to thickness of metal in walls. For an engine like the one I am designing water space between the two walls should not be less than 2½ times the thickness of cylinder wall metal.

$2.5 \times .250 = .625$ or ⅝ inch water space.

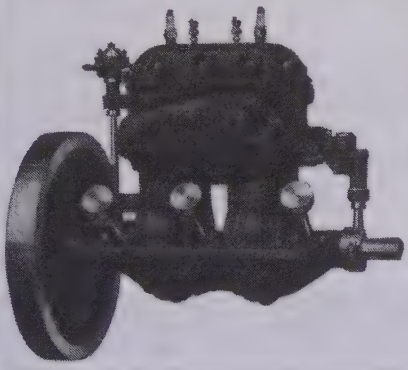
*Taken at about 3.5 times compression figures.

(Continued on page 16)

Consult a Specialist

About an Engine for Your Small Boat

For that new boat, you want an engine of just the right power, weight, size and speed to give you the exact kind of service required of it. Unless you already know what you need to secure the highest efficiency, **Don't Guess—Consult a Specialist Who Knows** what you need and can supply it.



You may already own an engine which is unreliable: maybe reliable, but too light or too heavy for your boat; or possibly it is unsuitable in other ways. **What's the Use of Having An Unsatisfactory Outfit?** Consult a specialist to find out what you need to get fixed up shipshape—and then get it.

Our eighteen years' concentrated effort and experience, studying and supplying the varied requirements of small boats, surely justify our calling ourselves specialists. Besides our 1917 line of Eagle Engines proves our claim.

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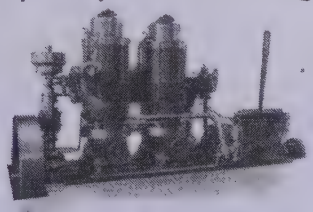
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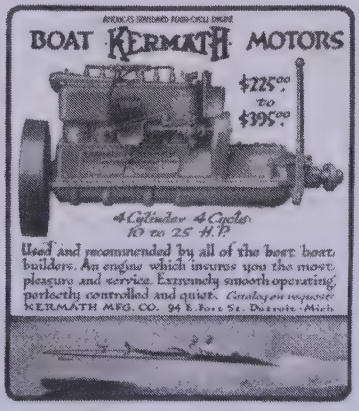
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in medium and heavy-duty types are made in sizes from 2 to 54 h.p., and we would strongly recommend them for operating on *Kerosene*, *Solar Oil* and *Gas Oil*. You ought to know more of the exclusive advantages the Kahlenberg offers you.

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Koukokusha ni otegami onsashidashi no saiwa doso RUDDER nite goran no mune onkakisoe negaimasu

5-K.W. AUTOMATIC ELECTRIC PLANT

To meet a constantly increasing demand for a larger size automatic electric lighting plant, The Matthews Engineering Company, Sandusky, Ohio, announces the addition of a 5-k.w. set to their present 1918 1 and 2-k.w. models.

This new unit performs all the functions of the smaller plants, starting and stopping automatically. It furnishes current for light and power, requiring no attention beyond replenishing the supply of fuel and oil.

The engine is four-cylinder, four-cycle, and develops 20 h.p., giving it a reserve capacity for nearly 100% overload. This, together with the fact that the set runs at the speed of 900 r.p.m., insures smooth, easy running, and long life.

The crank shaft is big and is mounted on three adjustable bearings of unusually liberal bearing surfaces. The cam shaft is driven by a silent chain, as is also the magneto and pump shaft. All moving parts are fully enclosed to insure quiet operation, yet are easily adjustable for wear through large hand-hole plates, which are quickly removable. The engine has been designed throughout for long life and dependable service.

The generator is especially designed for the work and is of General Electric make. It is directly connected to the engine through a flexible coupling, the armature being permitted to "float" in its bearings.

The entire power plant is mounted on a substantial base. The engine is water-cooled, the pump forcing water from a tank of large capacity through the cylinder jackets. This heated water is then returned to the water tank after being cooled by passing through an automobile-type radiator, through which a fan forces a stream of air. The vacuum feed gasolene system provides a constant supply of fuel to the engine from the main gasolene tank, which may be installed underground outside the building. Thus there are never more than a few pints of gasolene inside the building, and the insurance requirements are complied with.

The electrical apparatus is mounted on a neatly arranged switchboard and may be installed wherever convenient near the plant. It provides for the full automatic operation of the plant, keeping the batteries charged at all times. Any flow of battery current, either charge or discharge, is accurately measured so that the batteries are given better attention than if used on a hand-operated plant. For starting, current is taken from the battery and the generator is temporarily a motor until the engine starts firing. The plant is so arranged that the engine starts and recharges the batteries when they are 25% discharged. Thus the battery is never allowed to drop below 75% of full charge capacity, "sulphating" of the plants is prevented, and long life of the batteries is assured.

Whenever a heavy load is thrown on the line, such as a 2 or 3-h.p. motor, the engine automatically starts, even though the battery is fully charged In this way, the engine always carries the heavy loads, and the batteries are never called upon to furnish a large amount of current. Furthermore, when the plant continues running carrying the heavier loads direct from the generator and the batteries are full they are not harmed; in fact, they are given a slow easy charge so necessary for healthy condition of the cells.

A protective device guards the battery against the possibility of injury in case the engine refuses to start, as, for instance, if the supply of gasolene were exhausted. The battery is permitted to crank the engine for two minutes, after which time, if it has failed to start, the circuit breaker is thrown out and notification is thereby given by the failure of the lights that there is something at fault with the engine. All this is accomplished automatically by means of a time-limit meter which measures the discharge current. After allowing current to flow out of the battery for a certain time (it usually is set at about two minutes) the hand makes a contact, a "kick" coil is energized, and the circuit breaker is thrown out.

Another novel feature of this plant is the electrical governor. This instrument provides that when the engine is running light with no load on the line and only charging the batteries, it generates current at exactly the correct charging rate, yet it opens the throttle in response to any load put on the line. This obviates any possibility of the batteries being injured by too great a charging current, which is fatal to long life of the battery cells. This result is obtained by an ingenious arrangement which cannot be accomplished by any type of mechanical governor. It is an exclusive feature of "Matthews" plants, and in connection with the other apparatus provides absolute protection to the batteries. They are never given a long heavy charge nor a long or heavy discharge.

The equipment is of first quality throughout and in keeping with the mechanical workmanship on the plant. General Electric generator, Willard storage battery, Cutler-Hammer, Sangamo and Weston products used in connection with the Matthews special automatic arrangement, Stewart vacuum system and Bosch high-tension magneto, these are a few of the standardized products to be noted which go into the construction of the plant.

Full details can be obtained by writing The Matthews Engineering Company, Sandusky, Ohio.

* * *

ANNOUNCEMENT

Carlos de Zafra, M. E., is pleased to announce that he has resigned his position with the Telautograph Corporation, and accepted the appointment of Naval Constructor with The Foundation Company, Woolworth Building, New York, N. Y.

* * *

GRAY PRICES ADVANCE SEPTEMBER FIRST

On account of the increased cost of materials and labor, the Gray Motor Company finds that, in order to maintain the well-known high quality of Gray marine engines, an advance in the retail price of these engines must be made. The present prices will remain in force until September 1st, but on and after that date the prices on all Gray marine engines, both two and four-cycle, will be materially advanced.

On the four-cycle line the advance will amount to from $50 to $70. It would, therefore, be well for all prospective purchasers of Gray marine engines to place their orders now and obtain the benefit of present prices.

* * *

ADVANCE INFORMATION

The following information has been furnished by the Department of Commerce, U. S. Coast & Geodetic Survey:

NEW YORK, LONG ISLAND SOUND, DAVIDS ISLAND, LOWER GREEN FLATS—DECREASED DEPTH

A Coast and Geodetic Survey officer reports the existence of a boulder on Lower Green Flats, which has over it a depth of 1½ feet. From the rock the tower on the South end of Davids Islands bears 342° 45′ (N. ½ W. mag.), distant 605 yards.

This rock is a menace to the power boats which frequently use the passage between Boa Island and Middle Reef.—(No. 32 of 1917.) C. & G. Survey Charts: 272, 1213, 52. Coast Pilot, Part IV, 1915, p. 143.

* * *

BOGERT UNSINKABLE FREIGHT SHIP AND SUBMARINE DESTROYER

With the submarine question, the serious part the submarine is playing in the war and the attention that is being paid to any invention that may lessen that menace, the description of the Bogert Unsinkable Freight Ship and Submarine Destroyer is worthy of consideration. Lord Pirrie, the eminent shipbuilder and engineer, has praised Mr. Bogert's suggestions and plans, as his letter to Mr. Bogert tells. Lord Pirrie says:

Dear Sir: Your letter of the 2d instant, with its enclosures, has been forwarded to me here from Glasgow.

In the first place I must congratulate you on the very clear way you have explained the matter and for the very carefully thought-out drawings you have sent me.

Although the type of vessel you have thought out has been discussed frequently since the war broke out, and several old vessels have had alterations and additions made so as to accomplish some of the objects your design aims at, and some of the new vessels have had many of your suggestions worked into them, I feel it is my duty to pass your letter and plans on to the Admiralty direct for their consideration, and I am sure they, like myself, will much appreciate your having placed your ideas freely in their hands. As you say in your letter, this is no time to withhold any weapon that may put our enemy to flight, and I therefore think it my duty to send your idea to the highest quarter, and I feel sure the Admiralty will appreciate your desire to do everything you can to assist the Allied Nations in the great cause with which they are associated so freely.

Yours faithfully,

PIRRIE.

(Continued on page 18)

JOE'S FAMOUS REVERSE GEARS

Unexcelled for any type of boat from canoe to ocean tug. For motors from 1 H.P. to 500 H.P.



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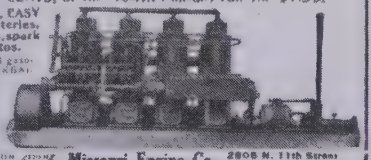
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WE GUARANTEE that they will run on less than ONE gallon of kerosene, solar oil, or fuel oil per day of ten hours, i.e., with solar oil @ $.05 a gallon, a 7-H.P. engine will run all day long for THIRTY-FIVE CENTS, or the 30-H.P. all-day run for $1.50.

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Send for bulletin giving full particulars and prices. **Missouri Engine Co.** 2808 N. 11th Street St. Louis, Mo., U. S. A.

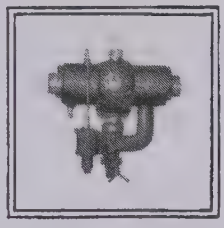
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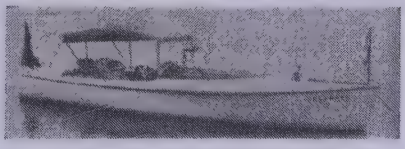


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We also build Sailing and Steam Yachts, Working boats of all kinds, Steel and wooden hulls. Motorboats a specialty; also with aerial propeller. Write for catalog.

(Continued from page 16)

not sold, and the company has enjoyed an export business which has increased from year to year and which has been said to be the largest export business of any marine engine manufacturer.

During his association with the Scripps Motor Company, Mr. Warman has traveled abroad and has put through some large Government contracts, particularly in Russia. His severing of business relations with the Scripps Motor Company is to enable him to take advantage of the present unusual export opportunities which, under war conditions, are of course much greater than could possibly come before any one manufacturer. Mr. Warman will continue in the same offices at 17 Battery Place, New York, from which the Scripps Motor Company's export business has been conducted the past year.

* * *

HYDE WHEELS

When Miss Detroit II won the Gold Challenge Cup at Minneapolis, in August, she added another to the long record of victories won by boats equipped with "Hyde" turbine type propellers.

For four consecutive years Hyde-equipped speeders have won the Gold Challenge Cup—the most important speed-boat trophy in the power-boat world. In 1914, Baby Speed Demon II won this highly prized trophy. In 1915, it was Miss Detroit. The year 1916 saw Miss Minneapolis show her heels to all comers, and now 1917 finds Miss Detroit II carrying off the coveted prize. All of these boats were equipped with Hyde turbine type propellers, which forms an unsurpassed record for propeller efficiency and consistency. In addition to winning the Gold Challenge Cup, Miss Detroit II also took the honors at the Thousand Islands, capturing the Challenge Cup and setting a new speed record for the course.

Many other famous boats have used Hyde turbine type propellers in attaining recognition in speed circles, such as Hawkeye II, Peter Pan VIII, Miss Miami, while Heldena, also Hyde-equipped, cleaned up everything in sight at the Canadian National Exhibition races at Toronto, winning the Great Lakes Gold Cup and Exhibition trophies.

The Hyde Windlass Company makes the statement that the "Hyde" is undisputably the fastest propeller in the world, and the above record substantiates such an assertion.

The Hyde catalog and price list will be mailed upon request to any interested party and their service department will gladly assist any boat owner in selecting the correct propeller for his outfit.

All communications should be addressed to the Hyde Windlass Company, Bath, Me.

* * *

NEW FACTORY

The Gray Motor Company has just finished a job that it is hoped will be the last of its kind for some time to come.

Moving the complete equipment of a large factory employing several hundred men is by no means a small task, but when, because of the rush of work and the fulfilment of contracts, this moving must be done without interruption to the production, some idea can be obtained of the enormity of the task.

Already at this writing most of the machinery from the machine shop and tool room have been installed in the new factory. The assemblers, however, are still busy at the old factory, building engines out of surplus stock machined by the shop before moving began, and turning out completed engines at the usual rate. Arrangements have been made so that four days after the last engine has been completed at the old plant engines will begin coming through at the new.

It is wonderful to note the precision and the systematic methods used in transferring huge stocks of raw and partly machined materials.

An organized gang of movers load the cars eight or ten a day. These are pulled out during the night and empties placed. The loaded cars are pulled twelve miles across the city to their brand-new, up-to-date factory, where another gang are receiving and unloading the contents.

The Gray Motor Company has been very fortunate in being able throughout this past year to give prompt deliveries, in spite of troubles experienced everywhere in getting raw materials, the labor shortage, etc.

The new factory, with more than double the floor space, will make it possible to keep better stocked. The new automatic machinery and latest improved methods of manufacturing will hasten production, so that with any sort of deliveries of raw materials at all the Gray Motor Company will be in position to even better its reputation for quick delivery of good engines.

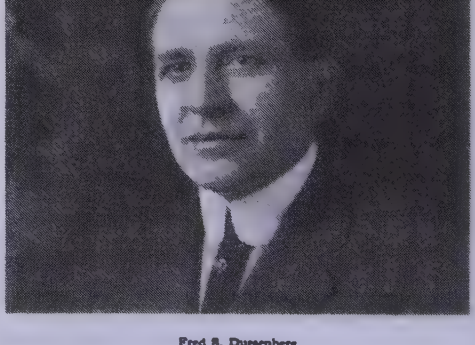
DUESENBERG ENGINES

Seventeen years ago, in a tiny garage and repair shop in Rockford, Ia., was born the idea which has reached maturity in the Duesenberg marine engine of today. Here it was that Fred S. Duesenberg built his first gasolene engine, a clumsy little motor-cycle engine which was exhibited at the first Chicago Show (Automobile). Even in those formative days the engine gave promise of a budding genius in design which has been fully realized in these later years. Catching a glimpse of the tremendous future of the automobile industry, Fred S. Duesenberg organized the Mason Motor Company, Des Moines, Ia., and spent a few years bringing out what was, in those days, a first-class machine. But this kind of thing didn't keep Fred S. busy enough, so in 1910 he branched out into the automobile racing game, as it seemed to offer the greatest field for the development of ideas and rapid and severe trial of their value. The first four-cylinder Duesenberg engine was built mostly in the basement of the Duesenberg home and took over a year to complete. However, it was a real engine and embodied improvements which have endured the rigors of many racing campaigns without a reason for any important change. This original engine was still propelling a car with a truck body on it at 50 miles an hour through the outlying districts of Chicago this Summer. Fred Duesenberg entered his first car in the Indianapolis Race of 1912 and was scoffed at for doing so, as his engine capacity was only 230 cu. in. as against the 450 cu. in. of the other cars. However, he got 78 m.p.h. out of the car in that race and eventually forced the abandonment of the 231 cubic-inch-class races.

The success of the Duesenberg racing engine since that time has been so outstanding that practically everybody knows the principal details. It is probably safe to say that at least 70% of all cars on the dirt and board tracks today in America are Duesenberg equipt.

Development of the gasolene engine for marine purposes has gone hand-in-hand with its perfecting in the automobile field, and when a prominent Chicago sportsman determined to do a seemingly impossible thing—produce a 60-mile boat—it was natural for him to turn to Fred Duesenberg to produce the power plant for him, as there was nothing on the market at that time powerful enough or reliable enough for his purpose. The problem was a tough one, but five months from the day the engine was first put on paper the engines were turning over in Disturber IV, the fastest 40-foot hydroplane yet developed in this country.

That was the start of the Duesenberg marine engine. Soon after the successful results obtained in the Disturber, the old Loew-Victor Engine Company, of Chicago, made a deal with Fred Duesenberg to become their chief engineer. He designed for them a six-cylinder and an eight-cylinder 6¼ by 7¾-in. marine engine. He also designed a four-cylinder airplane engine, a six-cylinder airplane engine and a series of automobile engines. Last Fall the Loew-Victor Engine Company was merged into the Duesenberg Motors Corporation, who have just moved into their big new plant at Elizabeth, N. J., where all three types of their engines will be manufactured in quantity.



Fred S. Duesenberg



A Very Spectacular Runabout

"Bob-About," owned by Mr. Julius Barnes of Duluth and New York, is one of those boats one would like to own. Speedy, comfortable, safe and dependable. A boat that makes everybody look around and that can pass everything it wants to. 26 feet long, designed by Crouch and built by the Reliance Motor Boat Company, "Bob-About" is the 1917 edition of the "Cinderellas." "Bob-About" is powered with a four-cylinder 6" x 6" Van Blerck and maintains an even speed of 36 miles an hour, which is some speed on the water. Try it some time, it's very exhilarating, an experience not soon to be forgotten.

The majority of boats of this type are equipped with Van Blerck engines, simply because the Van Blerck motor has proven itself in service to be reliable, consistent and very powerful. It is admittedly a highly successful high speed, high powered engine, an engine you will be proud to mention as powering your new boat.

Van Blerck Catalog is well worth writing for, it is interesting and instructive.

VAN BLERCK MOTOR CO.

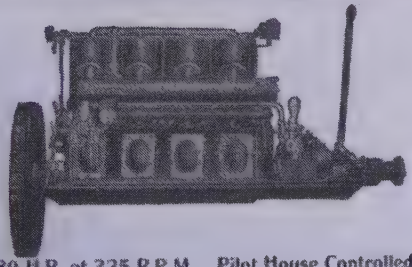
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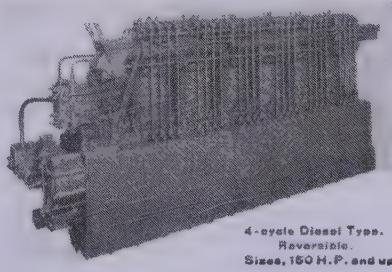
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CRAIG OIL ENGINES



4-cycle Diesel Type. Reversible. Sizes, 150 H.P. and up.

Desirable for all Types of Vessels

Service and Economies so pronounced that present unsatisfactory practices are made practical successes.

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Quarter-Deck Talk

Prepare for Peace

The waning season of 1917 sees many new conditions incorporated in the power-boat field. Early in the Spring, with the shadow of our inevitable participation in the world-war hovering over us, many of our prominent yacht clubs, fearing for the worst, decided upon a restriction of their activities this season.

Then came the time when our country entered the war and the air became filled with wild rumors about vast fleets of enemy submarines that were going to appear and attack our Eastern cities, bottle up our commercial shipping, and effectually prevent any consignments of American troops from landing in France or England. There was talk of confiscation by our Government of our private pleasure boats, and many predictions were made that the use of gasolene for pleasure purposes would be forbidden. Rumor also had it that, although our yachtsmen might see fit to put their boats into commission, they would not be permitted to leave their harbors and the use of their boats would be restricted in many other ways. While it is true that the Navy Department has established certain lines of patrol with strict instructions regarding the observance of the rules they have laid down in this respect, our yachtsmen have gradually been brought to a realization of the fact that our Government was not seeking to curtail their sport in any way.

Having passed through six months of a state of war without any untoward incident along our coasts, the latter end of the 1917 season has witnessed a resumption of club events, open races and cruises to an extent that is noteworthy. The eager rush of our yachtsmen to place themselves and their boats in the service of our country has no parallel in history as a response to our nation's needs from any given sphere of sport.

The builders of boats and engines, and the manufacturers of the many necessary accessories and fittings have placed their plants at the disposal of our Government and have rendered personal assistance whenever called upon. Huge orders have been placed by this and other Governments with our builders and manufacturers, and in every instance the product has given satisfaction. Necessarily many changes have also taken place in this connection. The fires of war have acted as a crucible in that many refinements in construction have been brought into being. Standardization has been perfected so that it has been made possible for one company alone to perform the hitherto undreamed-of feat of building large cruising boats at the rate of one per day.

Our engine builders, too, have successfully borne the brunt of the exacting conditions imposed by this world-war, with the result that our engines today stand in the forefront as models of all that engines should be in construction and satisfactory performance.

The trade in general has, of course, been given an unusual impetus by this necessity for increased production and, as a result, not only have the manufacturers experienced some welcomed prosperity after the several past lean years, but they have also been enabled to keep their organizations intact. There has been a plenitude of work for all who have had the ability and for plants that have had the necessary capacity,—features which augur well for the future of the industry. At this time, while our manufacturers are putting forth their best efforts in support of our country's war program, the trade is also quietly preparing itself for the widespread resumption of yachting and the tremendous increase in the ranks of power-boat enthusiasts that will directly follow the close of the war. It is quite likely that those who visited the 1917 Boat Show at Grand Central Palace, and who were duly impressed with the splendid achievements of our manufacturers in the display of their products at that exhibition, will be astounded by the many new things that will be seen at the 1918 Show, which is to open at the Grand Central Palace on Saturday, January 19th, and continue until the Saturday following. There will be boats of new types that our readers have not yet heard about and there will be tried and tested engines on view whose performances have not even been guessed at.

You who scan the pages of this magazine every month have undoubtedly heard many prophecies as to the probable duration of the present war. While we are not in the mood for prognostication at this moment, suffice it for us to predict, however, that, when the war-gods have been forever silenced, the power-boat industry will take its proper place in the front rank of the vast world-business that must inevitably follow the close of the present conflict.

YACHT SALES

The Hollis Burgess Yacht Agency has sold the following yachts:

The famous schooner yacht America, original winner of the America Cup, owned by Paul Butler and Blanche Butler Ames, of Lowell, Mass., to an Eastern Yacht Club Syndicate who will fit out this famous vessel and use her for yachting next season.

50-ft. water-line power boat Tramp, owned by Dr. Arial W. George of Scituate, Mass., to Lawrence F. Percival of Marblehead, Mass.

46-ft. water-line auxiliary yawl Asahi, owned by Howland S. Russell of Carpinteria, Cal., to Wm. Faversham, the well-known actor, for use at Huntington, L. I.

38-ft. power boat Luma II, owned by E. Waldo Reed of Boston, to Mrs. Charles G. Weld of Boston, for use at North Haven, Me.

30-ft. water-line yawl Wawenoc, owned by J. W. Farwell of Cohasset, Mass., to J. J. Dyer of Hingham, Mass.

30-ft. power boat Helen, owned by J. C. McDonough of Boston, to J. H. Andrews of Akron, Ohio, for use at Hyannisport, Mass.

27-ft. water-line sloop Ghost, owned by C. V. Barr of Rockport, Mass., to W. E. Doherty of Marblehead, Mass.

26-ft. power boat Mabelle, owned by Willard Welsh of Malden, Mass., to L. Sherman Adams of Boston.

Sonder sloop Panther, owned by Walter E. Hurley of South Boston, Mass., to Roy H. Walker of Detroit, Mich.

25-ft. water-line sloop Idalia, owned by Commodore David M. Wiseley of the Winthrop Y. C., to Joseph H. Elcock of Quincy, Mass.

Champion 18-ft. water-line racing sloop Louise, owned by A. I. Whittemore of Winthrop, Mass., to Philip A. Green of Boston.

(Continued on page 12)

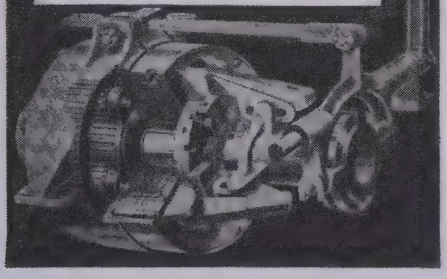
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POWER

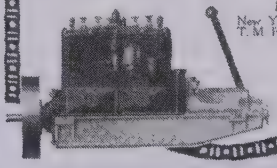
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Wisconsin Motors
CONSISTENT

for marine use contain those same qualities that have made Wisconsin Racing Motors champions of the world on road and speedway. If it's a Wisconsin it's a consistently dependable motor.

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Medium and Heavy Duty, 15 to 100-H.P.

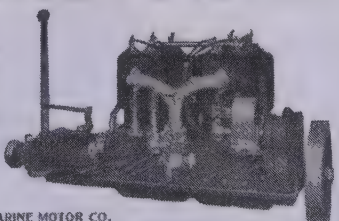
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MURRAY & TREGURTHA CO.
340 West First St. South Boston, Mass.

Bei Bestellungen beziehen Sie sich bitte auf THE RUDDER

(Continued from page 10)

18-ft. water-line racing sloop Bonitwo, owned by R. R. Smith of Gloucester, Mass., to Commodore Walter B. Lane of the South Boston Y. C.

30-ft. power boat Veritas, owned by F. B. Howard of Brockton, Mass., to E. Atherton Smith of St. John, New Brunswick.

25-ft. water-line auxiliary yawl Corona, owned by Alanson Bigelow, Jr., of Boston, to Elton S. Wayland of Waterbury, Conn.

23-ft. water-line knockabout Chu San, owned by R. E. Pope of Marblehead to Joseph Allen of New York.

26-ft. auxiliary catboat Grace, owned by John Manahan of Milton, Mass., to Henry Bergh of East Hampton, L. I.

18-ft. water-line sloop Dormie, owned by G. D. Hartshorn of Taunton, Mass., to John P. Harrington of South Boston.

The same agency has also chartered the 55-ft. power boat Alsorie III, owned by C. Neal Burnell of Boston, to Frank B. McQuestin of Boston, and the 50-ft. power boat Gull, owned by C. A. Cunningham of Boston, to Louis K. Liggett of Boston.

* * *

SOUVENIR CATALOG

The Duesenberg Motors Corporation has issued a very handsome souvenir catalog, printed on heavy calendered paper in colors. It contains a full description of the engines which have been put in so many high-speed boats and illustrations show all the parts of these engines. Then there are several pages devoted to pictures and descriptions of the vessels in which the Duesenberg engines have been installed. Among these are the Perfecto, Judy VI, Black Watch, Marjo, Dauntless, Bonita, U. S. Navy Torpedo Boat, Inquirer, and Mystery, and these are shown running at high speed. The cover is embossed and the color scheme is blue and gray. The title page is named The Wave and depicts Neptune controlling the winds, and mermaids sporting on the crests of the waves.

The catalog was designed and written by Rex W. Wadman, who devoted much time to its production. The Duesenberg book will be kept by those who are fortunate enough to secure a copy, because it gives an insight into the advance made in boat construction and design and because it gives pictures of some really spectacular boats.

* * *

SINCLAIR MARINE FILLING STATIONS

The illustration shows the new Sinclair Marine Filling Stations, which are about to be established in the following harbors for the distribution of Sinco products: Newport, R. I.; Fall River and Boston, Mass.; Detroit, Mich.; Buffalo, N. Y.; Chicago, Ill.

These boats are 95 ft. long with 25 ft. breadth, and are equipped with 5-gallon gasolene pumps, 1-gallon lubricating oil pumps, and 5-gallon kerosene pumps. They will be anchored day and night in the respective harbors so that power boats can come alongside at all times.

These stations are to be operated on the same plan as their automobile drive-in filling stations. For years past, power yachtsmen, especially those who had boats of large capacity, have been obliged to go alongside of a dirty, dusty dock and perhaps await the arrival of a tank wagon or other inconvenient way of getting gasolene.

* * *

Statement of the Ownership, Management, Circulation, etc., required by the Act of Congress of August 24, 1912, of THE RUDDER, Published Monthly, at New York, N. Y., for October 1, 1917.

State of New York,
County of New York.

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared Andrew Paterson, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE RUDDER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown above, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The Rudder Publishing Co., 254 West 34th Street, New York City; Editor, Arthur F. Aldridge, 254 West 34th Street, New York City; Business Manager, Andrew Paterson, 254 West 34th Street, New York City; Managing Editor, None.

2. That the owners are: The Rudder Publishing Co., 254 West 34th Street, New York City; Arthur F. Aldridge, 254 West 34th Street, New York City; Andrew Paterson, 254 West 34th Street, New York City; Jas. R. Thomson, 254 West 34th Street, New York City; A. de Z. Patton, 254 West 34th Street, New York City; F. W. Goeller, Jr., 254 West 34th Street, New York City.

3. That the known bondholders, mortgagees and other security holders owning or holding one per cent. or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

ANDREW PATERSON, *Business Manager.*

Sworn to and subscribed before me,
this 10th day of October, 1917.

THOMAS FRAZIER, *Notary Public.*
Commission Expires March 30, 1918.



BOAT SHOW—1918

Opens Saturday, January 19th, 1918

Closes Saturday, January 26th, 1918

Reserve Your Space Now

Address IRA HAND, Secretary, 29 West Thirty-ninth Street, New York City

Announcing the 1918 Duesenberg Marine Engines

The Duesenberg 1918 Models are an evolution of the Duesenberg Engines of previous years. The basic design remains the same. The dominating features that have made Duesenberg Engines the highly efficient big motors they are today, are retained in their entirety. Refinements have been made here and there. The new engines are quieter, better looking, more dependable, if that be possible. Increased production, highly specialized manufacturing methods, all tend to improve the engines. The use of special metals and alloys increases their durability.

A remarkable book has been prepared in which these engines are illustrated and described in detail. In this book has been collected all the necessary details pertaining to these motors, yet this data is displayed in an easily readable manner. This book is not a catalog, does not read like one, look like one or pretend to be one. In it you will find page after page of beautiful boat pictures illustrating the spectacular, successful boats of the season. These boats represent the highest attainable degree of beauty, luxury and efficiency. It is an inspiration to look at them.

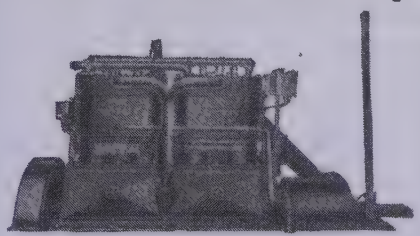
The book itself is a book of art, elaborately illustrated and decorated. Probably the most beautiful piece of printed art of the year. It is an art gallery of the best boats, the fastest boats, the most luxurious boats. You will retain it for its beauty, for its uniqueness, for the valuable information it contains.

This book will be mailed promptly upon request. Owing to the high cost of producing such a book it is necessary that all requests be accompanied by a remittance of One Dollar unless the request be written on the stationery of a rated firm or individual.

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The 20th Century



2, 3, 4 and 6 Cylinders 10 H.P. to 300 H.P.

Marine Gasolene Engine

means just what the name implies. It is the engine of the 20th century. Some of the many advantages are

Neatness of Design, Ease of Operation, Simplicity of Construction, Absence of Vibration and Noises, Economy of Fuel, Moderate Revolutions and Ample Bore and Stroke

To sum up, the 20th CENTURY ENGINE embodies all the latest improvements, together with a standard of construction that will take others years to equal.

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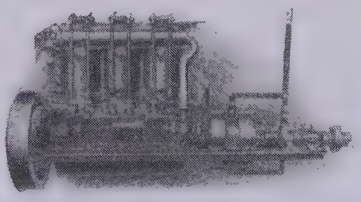
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Builders of Yachts, Launches and Business Boats of all descriptions.
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18-25-H.P. Speed 400-550 R.P.M. Minimum Speed 150 R.P.M. Length with reverse gear 65¾ in. Weight with reverse gear 1,050 lbs.

RELIABILITY.—This word means more to the power-boatman and the motor-boatist than any other word in the English language. It is the very foundation of contentment and service.

RELIABILITY in the power plant in your craft or in the one you expect to own makes for greater efficiency, greater convenience and greater economy.

You want a motor you can absolutely rely upon. One that will give you constant service. A motor that has demonstrated its powers of endurance beyond the shadow of a doubt. You want a FRISBIE-VALVE-IN-HEAD MOTOR.

The FRISBIE motor is simple in construction. It is different. The valve-in-head design means more power, greater elasticity and it is built for many years of faithful service.

Write us for detailed explanation of its other advantages and for definite facts and figures covering your requirements. Let us also send you names of FRISBIE owners and our illustrated catalog.

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Aberdeen Shipyards, Aberdeen, Wash.
Alaska Pacific Navigation Company, Seattle, Wash.
Allen Shipbuilding Company, Seattle, Wash.
Alabama-New Orleans Transportation Co., New Orleans, La.
Albina Engine & Machine Works, Inc., Portland, Ore.
American Bridge Company, Ambridge, Pa.
American Bridge Company, Trenton, N. J.
American Shipbuilding Company, Warrenton, Ore.
American Shipbuilding Company, Cleveland, Ohio.
American Shipbuilding Company, Buffalo Yards.
Ames Shipbuilding & Drydock Company, Seattle, Wash.
Anderson Shipbuilding Corporation, Lake Washington, Wash.
Anderson Shipbuilding Company, Seattle, Wash.
Atlantic Coast Company, Boothbay Harbor, Me.
Babare Brothers, Tacoma, Wash.
Bagdad Shipbuilding Company, Mobile, Ala.
Baltimore Dry Dock & Shipbuilding Company, Baltimore, Md.
Banning Shipyard, Mormon Island, Los Angeles, Cal.
Barrett Shipbuilding Company, Mobile, Ala.
J. D. Barnes Shipbuilding Company, Alameda, Cal.
Barnes & Tibbits, Oakland, Cal.
Bath Iron Works, Bath, Me.
Beaumont Shipbuilding & Dry Dock Company, Beaumont, Tex.
Bendixen Shipyard, Eureka, Cal.
Biddeford Shipyard, Biddeford, Me.
Biloxi Shipyard & Box Factory, Biloxi, Miss.
F. F. Bingham, Pensacola, Fla.
Boothbay Harbor Shipbuilding Company, Boothbay Harbor, Me.
Charles Bright, Sandusky, Ohio.
Brunswick Construction Company, Brunswick, Ga.
Buffalo Dry Dock Company, Buffalo, N. Y.
Bethlehem Steel Corporation, Bethlehem, Pa.
California Shipbuilding Company, Long Beach, Cal.
Camden Anchor-Rockland Machine Company, Camden, Me.
Cameron-Genoa Mills Shipbuilders, Ltd., Victoria, B. C., Can.
Carpenter-Watkins Shipbuilding Company, Brunswick, Ga.
Chester Shipbuilding Company, Chester, Pa.
Chicago Shipbuilding Company, Chicago, Ill.
City of Gulfport Shipbuilding Company, Gulfport, Miss.
Clooney Construction & Towing Company, Westlake, La.
Coast Shipbuilding Company, Portland, Ore.
Coastwise Shipbuilding Company, Baltimore, Md.
G. M. Cochrane, Fox River, N. S., Can.
Collingwood Shipbuilding Company, Collingwood, Ont., Can.
Columbia Engineering Works, Linnton, Ore.
Columbia River Shipbuilding Corporation, Portland, Ore.
Cookson & Walker, San Pedro, Cal.
J. Coughlan & Sons, Vancouver, B. C., Can.
John F. Craig, Long Beach, Cal.
Craig Shipbuilding Company, Long Beach, Cal.
Wm. Cramp & Sons Ship & Eng. Bldg. Co., Philadelphia, Pa.
William Cryer & Sons, Oakland, Cal.
Cumberland Shipbuilding Company, Portland, Me.
Cushman O. McKown, Wilmington, N. C.
L. N. Dantzler Lumber Company, Moss Point, Miss.
Jas. & Jas. E. Davidson, Bay City, Mich.
M. Mitchell Davis & Son, Solomons Islands, Md.
Delaware Shipbuilding Company, Seaford, Del.
T. C. Desmond & Co., New York City.
Detroit Shipbuilding Company, Wyandotte, Mich.
John Deveau, Metegham, N. S., Can.
Dubuque Boat & Boiler Works, Dubuque, Iowa.
John M. Dullahan & A. A. Daugherty, Orange, Tex.
Dunn & Elliott Company, Thomaston, Me.
The Elco Company, Bayonne, N. J.
H. Elderkin & Co., Port Greville, N. S., Can.
Elizabethport Shipbuilding Company, Elizabethport, N. J.
Elliott Bay Shipbuilding Company, Seattle, Wash.
Erickson Shipbuilding Company, Seattle, Wash.
Everett Marine Ways, Everett, Wash.
Favre Shipbuilding Company, Gulfport, Miss.
Feeney-Bremer Company, Tillamook, Ore.
Fellows Yacht & Launch Company, Los Angeles, Cal.
W. & A. Fletcher Company, Hoboken, N. J.
Fore River Shipbuilding Corporation, Quincy, Mass.
Foundation Company, New York City.
Orlando E. Frost, Belfast, Me.
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Captain Geo. A. Gilchrest, Thomaston, Me.
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Globe Shipbuilding Company, Superior, Wis.
Glynn Shipbuilding Company, Brunswick, Ga.
Grant Smith-Porter-Guthrie Company, Aberdeen, Wash.
Grays Harbor Motorship Corporation, Aberdeen, Wash.
Grays Harbor S. B. Company, Aberdeen, Wash.
Heath Shipbuilding Company, Portland, Ore.
Heffernam Engine Works, Seattle, Wash.
Henderson Shipbuilding Company, Mobile, Ala.
Hillyer, Sperring & Dunn, Jacksonville, Fla.
Gas Engine & Power Co. & Chas L. Seabury & Co., N. Y. City.
Gulf City Boiler Works, Mobile, Ala.
Hammond Lumber Company, Eureka, Cal.
Hanlon Dry Dock & Shipbuilding Company, Oakland, Cal.
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Mark Johnson, Leschi Park, Seattle, Wash.
Johnson Shipyard Corporation, Mariners Harbor, S. I., N. Y.
Kelly-Spear Company, Bath, Me.
Daniel Kern & John Kiernan, Portland, Ore.
Kingston Shipbuilding Company, Kingston, N. Y.
G. W. Kneass, San Francisco, Cal.
Kruse & Banks, Coos Bay, Ore.
Kyle & Purdy, City Island, New York.
Lacy Brothers, Rochester, N. Y.
Lake Erie Dry Dock & Mill Company, Sandusky, Ohio.
The Lake Torpedo Boat Company, Bridgeport, Conn.
George Lawley & Sons Corporation, Neponset, Mass.
Lone Star Shipbuilding Company, Beaumont, Tex.
Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, Cal.
Luders Marine Construction Company, Stamford, Conn.
William Lyall Shipbuilding Co., North Vancouver, B. C., Can.
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Manitowoc Shipbuilding Company, Manitowoc, Wis.
Mann Yacht Building Company, Baltimore, Md.
Marine Iron Works, Seattle, Wash.
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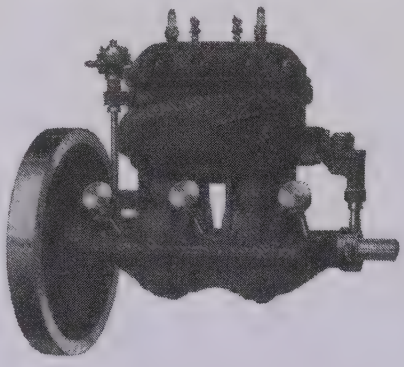
Eagle Marine Engines

This Company has specialized for eighteen years on two-cycle Marine Engines for pleasure and working boats. The product during these years has progressed with the demands, and today Eagle Engines are as near perfection as experience and modern manufacturing equipment can make them.

Our line covers every requirement for boats up to 25 feet in length of the pleasure and working models, and in our offering you can find an engine that will meet your exact requirements.

As "Eagle" Engines are sold through established dealers throughout the world, the service possible under these conditions is of considerable importance to the user.

It's not too early to arrange for 1918 agencies at this time. We are always pleased to give applications our prompt consideration.



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THE TORRINGTON COMPANY
STANDARD PLANT
TORRINGTON, CONN.

Kahlenberg

Heavy-Duty Crude Oil Engines



Positive Governor Control from no load to full load. Will run idle any length of time and pick up full load instantly without losing a single impulse. You carry only one kind of fuel (crude oil), which is used for starting and operating. Built in sizes 60 h.p. and up.

Kahlenberg Standard Engines

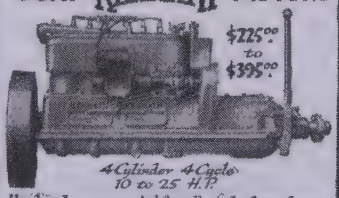
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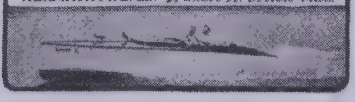
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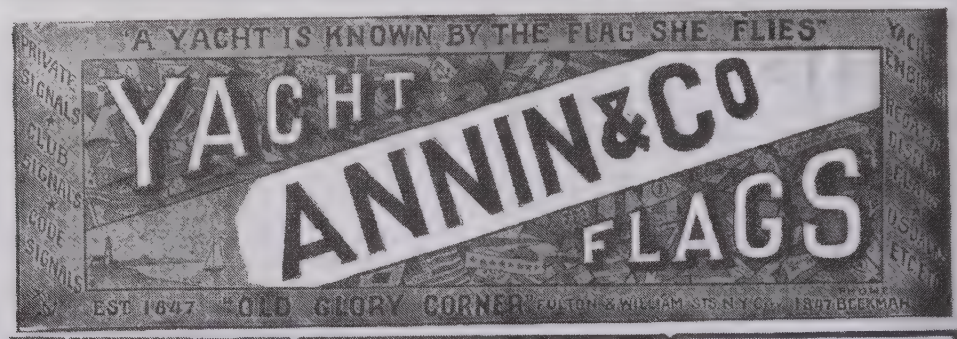
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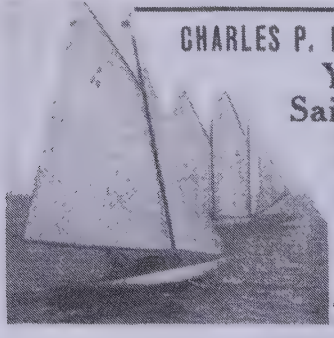
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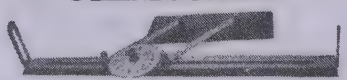
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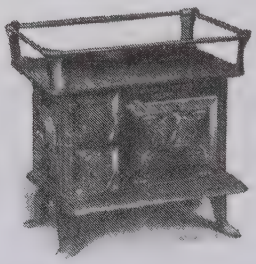
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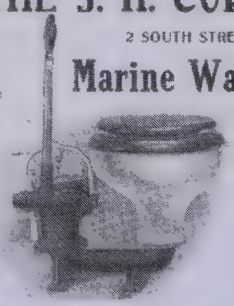
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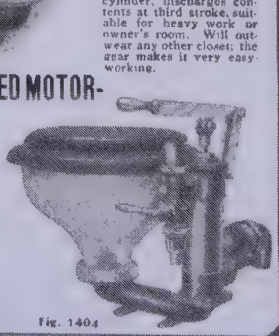


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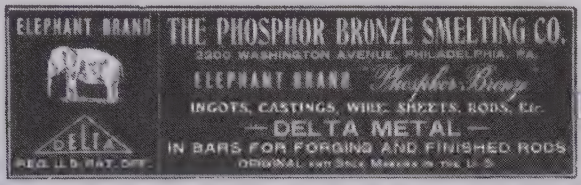
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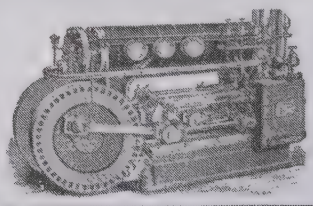
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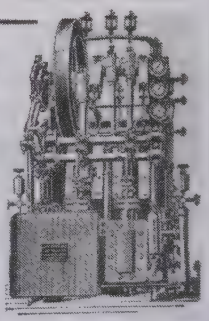


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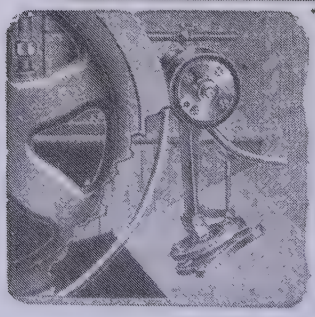
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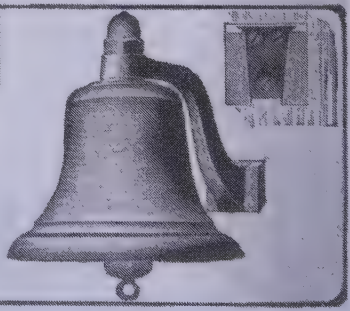
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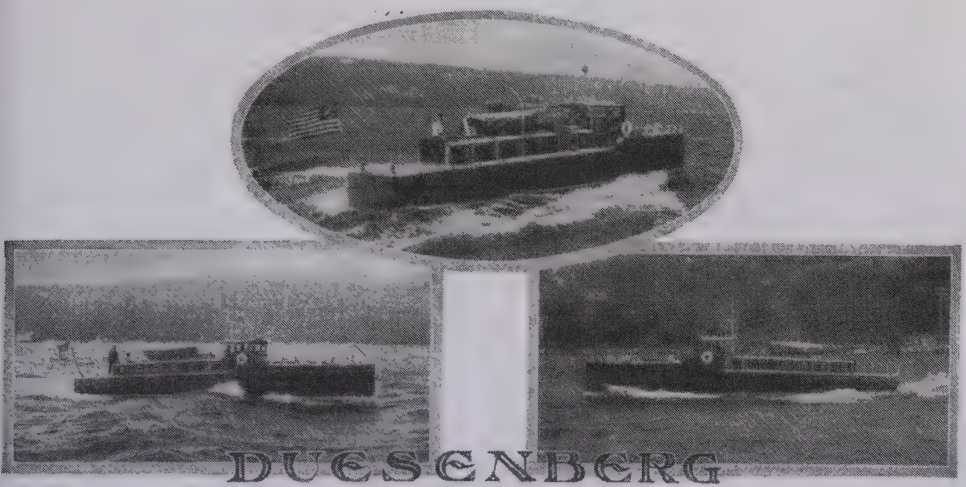
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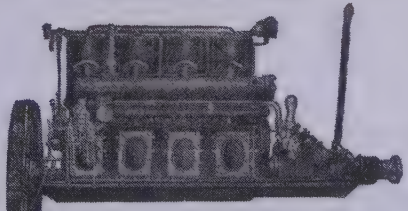


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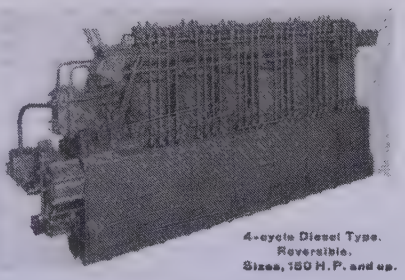
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Quarter-Deck Talk

1918 Show

In the Fall of last year when arrangements were being made for the 1917 National Power-Boat Show, there was considerable discussion in the trade with regard to the probable outcome of that exhibition and many dire predictions were made that the Show would be a failure "on account of the war". Government restrictions, embargoes on railroad shipments, scarcity of materials, financial depression, and a multitude of other reasons were advanced to show why the war would play havoc with the exhibition and the industry itself.

What happened?

The 1917 National Power-Boat Show was the best exhibition from every standpoint ever held. More space was sold to exhibitors than ever before, the attendance far exceeded expectations, and the number of actual orders booked by the builders and manufacturers during the Show were far in advance of any previous record.

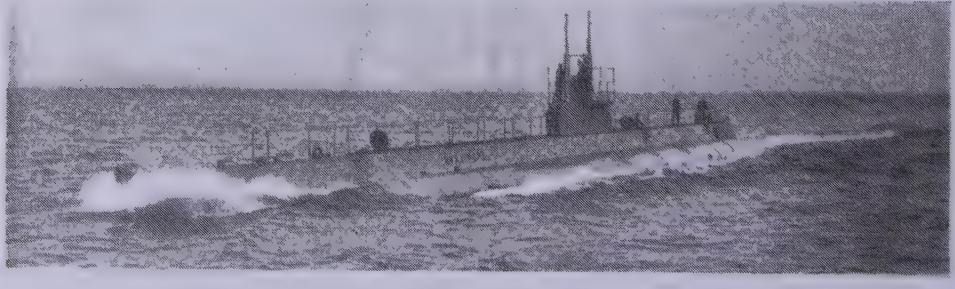
Since last year's exhibition we have seen this country make its entrance into the war to do its part—and a mighty big and important part it will be—toward the permanent establishment of the doctrines of democracy. Instead of an industry that, according to some opinions, was destined to be entirely wiped out by the war, the marine industry, by reason of huge orders for boats, engines and equipment for export and domestic use, has undergone a complete change for the better. The financial conditions of many of our plants have been vastly improved and every available piece of machinery and equipment is being utilized to its utmost capacity. Many of the concerns engaged in the marine industry are working both day and night shifts to fill their orders, and many more would be running their plants throughout the full twenty-four hours were it possible for them to obtain the necessary extra number of experienced workmen.

The builders and manufacturers are determined that their industry shall not lose its identity, and a reflection of this attitude will be seen in the 1918 National Power-Boat Show which will open its doors to the public on January 19th next at Grand Central Palace, New York City. Impressed with this opportunity for legitimate advertising and having in mind the great influx of business that will undoubtedly be their portion when the war ends, the builders and manufacturers are bending every effort toward making the coming exhibition an expression of their present and past achievements, and of their confidence in what the future holds for the power-boat industry.

Allotment of space to members of the National Association was made by the Exhibition Committee on November 16th last, some three weeks earlier than the date upon which allotments were made last year for the 1917 Show. It is reported that a great many of the manufacturers have applied for increased space over that occupied by them last year and that at this early date fully 75% of the total available space on the main and mezzanine floors of Grand Central Palace has been taken.

New York City, always a seething beehive of industry, is, through the Winter months particularly, a mecca for visitors from all over this country and abroad. Owing to the present conditions, New York's capacities for the housing and entertainment of its guests will be taxed to the utmost this Winter. The attendance at the coming Show should therefore reach the highest point yet attained, the more so by reason of the fact that the dates of the 1918 exhibition have been so arranged that the Show opens exactly one week following the close of the National Automobile Show. As the two industries are closely allied to each other, particularly in so far as the accessory end of the business is concerned, this arrangement of dates will undoubtedly work to the advantage of both of these exhibitions. The Chicago Automobile Show is to be held the week following the close of the Boat Show in New York, and this will enable manufacturers and others interested in both trades to attend each of these exhibitions without serious inconvenience.

A careful review of all conditions therefore indicates that the coming Show will undoubtedly be one of the most successful and interesting ever held. The trade has already given evidence that it intends to support the Show liberally and a number of concerns that have never exhibited before have already booked space. The marine manufacturers are showing the spirit of the times by thus availing themselves of every possible means for the expansion of their business, and those who participate in the coming Show will surely reap the reward that is the due of the aggressive business man under all conditions.



Isaac Peral, a Spanish Submarine, Built by Submarine Boat Corporation. Nelseco Engines

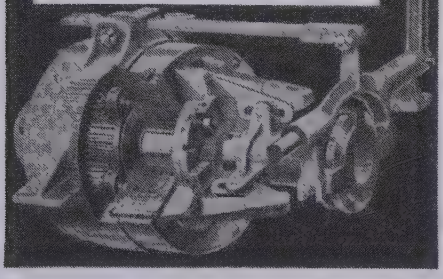
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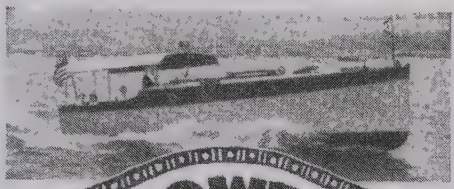
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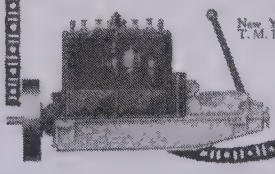
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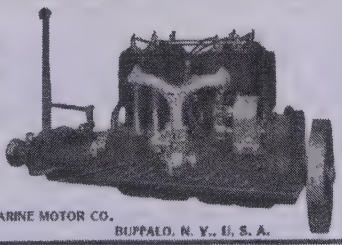
When you buy a Brennan Motor you get a complete outfit ready to run. The unusual size of the bearings, large valves and long stroke insure power and continuous service under all conditions. Very economical in fuel consumption.

Our New Model B Unit Power Plant is one of the finest engines ever produced. No expense has been spared in developing it to the smallest detail and we honestly believe its equal does not exist. Let us send you further details.

BRENNAN MOTOR MANUFACTURING COMPANY, SYRACUSE, N. Y.

PEERLESS ENGINES

4-cycle sizes 8 to 50 H.P.



PEERLESS MARINE MOTOR CO.
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NEWARK BAY SHIPBUILDING YARD

The new shipyard of the Submarine Boat Corporation is fast nearing completion. This yard, which is to be owned by the United States Government for which the Submarine Boat Corporation acts as agents, is on Newark Bay within what may be termed the Metropolitan District, in which there are 7,000,000 inhabitants. It occupies 125 acres of land and is opposite the Bayonne plant of the Submarine Boat Corporation. At present the administration building, hotel and restaurant, terminal stations for the railroad, fabricating shops, machinery building and other structures are growing fast, and it is planned to lay the keel of the first 5,000-ton cargo carrier on December 1st. On the waterfront twenty-eight sets of building and launching ways are now being prepared. These are built in sets of two, having derricks between the boats and other derricks at the head of the ways. These ways occupy 2,700 feet of waterfront. On one side of the yard is a long pier and dock 4,400 feet in length, where the hulls will be moored after launching to have their engines, boilers, spars and other fittings installed.

When in full blast twenty-nine steel vessels of 5,000 tons dead weight capacity will be built at the same time, and the parts for these vessels are now being fabricated at the steel mills and bridge building plants. Three railroads run into the shipyard, in which there will be 15 miles of standard gauge railroad track running into the many shops and sheds.

Henry R. Carse, formerly president of the Hanover National Bank, is president of the Submarine Boat Corporation and he is devoting all of his time to systematize the big organization so that it will be able to turn out the many ships needed in fast time. Henry R. Sutphen, who first conceived the idea of building cargo carriers by standardized methods of fabrication, is also devoting his time to the new work. B. L. Worden, formerly president of the Lackawanna Bridge Company, is general manager of the new plant; George T. Horton, formerly president of the Chicago Bridge & Iron Company, is assisting Mr. Worden, and Daniel H. Cox is resident engineer and constructor, representing the Emergency Fleet Corporation.

Twelve thousand men will be employed in this work and special appeals to all workers have been made to enlist in the work of building ships for the country in this time of need. Anyone who can handle a tool can find work and they have the advantage in this work of being able to live in their own homes, as the plant is almost in the city of New York.

Two hundred 5,000-ton vessels are to be built at once and in a few weeks from now the work of assembling all the material will be in full blast.

* * *

SHIPYARDS OF THE WORLD

A summary of the world's shipping facilities just completed by the Shipping Affairs Bureau of the Japanese Government shows that there are 880 shipyards, of which 264 are equipped to build steel ships of 1,000 tons or more, while 416 are able to turn out vessels of less than 1,000 tons. The plants covered by the inventory and the nations in which they are located are given as follows: "Britain, 236; British colonies, 58; Holland, 105; Germany, 51; Japan, 25; Italy, 18; France, 25; Austria-Hungary, 9; Spain, 14; Belgium, 7; America, 48; Norway, 24; Sweden, 17; Denmark, 9; Russia, 17; China, 5; other nations, 12."

* * *

PROPELLERS FOR 225 VESSELS

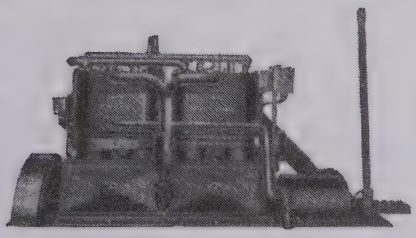
The American Screw Propeller Company, of Philadelphia, has in one year designed propellers for 225 vessels, including tankers, freighters, passenger and motorships, auxiliary schooners, yachts, tugs and towboats. The average diameter of these propellers was 12 ft. 1 in. and the extreme diameter 19 ft. 2 in.; 50% were cast of bronze and the other half were of cast iron, cast steel and semi-steel; 60% of the propellers were cast solid and 40% built up, and the same proportions held good for four-bladed and three-bladed wheels, respectively. The average shaft horsepower was 1,804 and the average revolutions per minute 171.5. These wheels were for vessels ranging all the way from 50 to 880 ft. long. * * *

PACIFIC COAST OFFICE

The McIntosh & Seymour Corporation wish to announce that on account of the present unusual demand for marine equipment, it has decided to transfer Mr. C. G. Cox, their present central district manager, to the Pacific Coast, and close his office in St. Louis temporarily.

Mr. Cox will now make his headquarters in San Francisco and Portland.

The 20th Century



2, 3, 4 and 6 Cylinders 10 H.P. to 300 H.P.

Marine Gasolene Engine

means just what the name implies. It is the engine of the 20th century. Some of the many advantages are

Neatness of Design, Ease of Operation, Simplicity of Construction, Absence of Vibration and Noises, Economy of Fuel, Moderate Revolutions and Ample Bore and Stroke

To sum up, the 20th CENTURY ENGINE embodies all the latest improvements, together with a standard of construction that will take others years to equal.

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THE NEW YORK YACHT, LAUNCH & ENGINE CO.
Morris Heights, New York

Builders of Yachts, Launches and Business Boats of all descriptions.
High-class Workmanship a Specialty
Design and Construction Unsurpassed—Joiner Work Unequaled
Prices Phenomenally Low
Call or write and give us a chance to prove it

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RELIABILITY



THREE-CYLINDER
18-25-H.P. Speed 400-550 R.P.M. Minimum Speed 150 R.P.M. Length with reverse gear 65¾ in. Weight with reverse gear 1,050 lbs.

RELIABILITY.—This word means more to the power-boatman and the motor-boatist than any other word in the English language. It is the very foundation of contentment and service.

RELIABILITY in the power plant in your craft or in the one you expect to own makes for greater efficiency, greater convenience and greater economy.

You want a motor you can absolutely rely upon. One that will give you constant service. A motor that has demonstrated its powers of endurance beyond the shadow of a doubt. You want a FRISBIE-VALVE-IN-HEAD MOTOR.

The FRISBIE motor is simple in construction. It is different. The valve-in-head design means more power, greater elasticity and it is built for many years of faithful service.

Write us for detailed explanation of its other advantages and for definite facts and figures covering your requirements. Let us also send you names of FRISBIE owners and our illustrated catalog.

THE FRISBIE MOTOR COMPANY, 56 Cone St., Middletown, Conn.

Handbook of Ship Calculations

Construction and Operation

BY

CHARLES H. HUGHES

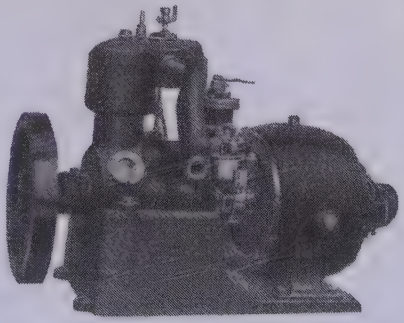
CONTENTS:

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Ship Calculations
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A HIGHLY developed direct-connected Generator Set. Used on some of the finest yachts built during the past few seasons. Nothing like it in existence, for those wishing a compact and reliable plant, suitable for yachts from 40 to 80 feet, operating interior, running lights, electric fans, searchlights, etc. The air compressor may be used for whistle, air pressure on water tanks, or supplying air pressure for starting engine. Used by U. S. Government on scout cruisers. ¶ Let me send you a few Light facts.

R. S. MILLS, 173 Lexington Ave., Brooklyn, N. Y.

THE SECRETARY OF THE TREASURY
WASHINGTON, D. C.

To the Officers and Enlisted Men and Women of the Army and Navy of the United States and Their Relatives:

The Secretary of the Treasury, through the Bureau of War Risk Insurance, has been charged with the administration of the War Insurance Law enacted by the Congress as a measure of justice to the men and women who have been called to give their lives, if need be, in the service of their country.

I wish to acquaint you with the benefits and privileges which your Government has placed at your disposal. It is essential that you and your families at home should know of your and their rights under this law in order that full advantage may be taken of them.

To care for the wife and children of the enlisted man during his service, the War Insurance Law compels him to contribute up to one-half of his pay for their support. The Government, on application, will generously add to this an allowance of from $5 to $50 a month, according to the size of the family. Moreover, if the enlisted man will make some further provision himself for a dependent parent, brother, sister, or grandchild, they may be included in the Government allowance.

If, as a result of injuries incurred or disease contracted in the line of duty, an officer or enlisted man or an Army or Navy nurse should be disabled, provision is made for compensation of from $30 to $100 a month to him, and, should he die, compensation of from $20 to $75 a month will be paid to his wife, his child, or his widowed mother.

In order, however, fully to protect each person and family, Congress has made it possible for every soldier, sailor, and nurse to obtain life and total-disability insurance. This insurance applies to injuries received while he or she is in the service or after he or she shall have left it.

Exposure to the extra dangers of war makes the cost of life insurance in private life insurance companies prohibitive. It was, therefore, a plain duty and obligation for the Government to assume the risk of insuring hundreds of thousands of our soldiers and sailors who are making the supreme sacrifice. Under this law, every soldier and sailor and nurse, commissioned and enlisted, and of any age, has the right, between now and February 12, 1918, to take out life and total-disability insurance up to $10,000 at very low cost, with the Government without medical examination. This right is purely optional. The soldiers and sailors are not compelled to take insurance, but if they desire to exercise the right, they must do so before the 12th of February, 1918. The cost ranges from 65 cents monthly, at the age of 21, to $1.20 monthly, at the age of 51, for each $1,000 of insurance. This is a small charge on a man's pay—small in proportion to the benefits it may bring. The premiums will be deducted from his pay, if he desires, thus eliminating trouble on his part.

To provide adequate protection until February 12, 1918, during the period when the soldiers and sailors are learning the details of this law, the Government automatically insures each man and woman, commissioned or enlisted in the military service of the United States. It pays the man $25 a month during total permanent disability; if he dies within 20 years, it pays the rest of 240 monthly installments of $25 each to his wife, child, or widowed mother.

I desire to call the provisions of this just and generous law to the attention of our officers and enlisted men and women so that they may not be deprived of their rights through lack of knowledge. Full information may be obtained from the Bureau of War Risk Insurance of the Treasury Department, Washington, D. C. I earnestly urge that the officers of the Army and Navy give to the men under their command all possible aid in helping them to understand fully the benefits that this insurance may bring to their families and the small cost at which it may be obtained.

This is the greatest measure of protection ever offered to its fighting forces by any nation in the history of the world. It is not charity; it is simply justice to the enlisted men and women and to their loved ones at home, and each and every one of them should promptly take the benefits of this great law.

W. G. McAdoo.
Secretary of the Treasury.

* * *

ONEIDA LAKE YACHTSMEN

Members of the Oneida Lake Y. C., headed by President George W. Boyce, have started a movement to obtain the transfer of power-boat races, formerly staged at Oswego and Rochester, to Lewis Point, headquarters of the Oneida association.

Clubs in Rochester and Oswego have been taken over by the United States Naval Reserve and now are being used by the Government.

For the races, which will be held during July and August, the National Power-Boat Racing Association will donate prizes valued at $2,000. The Oneida club proposes to stage contests between power boats in July and following with a rowing and sailing regatta in August.

The Oneida Lake Boat Club was chartered a number of years ago and owns about fourteen acres of ground on the lake shore at Lewis Point. The property, which has a clubhouse, boat landings and tennis courts, recently has been fenced in and other improvements are under way.

Mr. Boyce said that the limit of membership had been extended to 500 and that the list was nearly filled, with a number of prominent men from Syracuse, Utica, Rome and Oneida among the members.

Lewis Point is about 25 miles from Syracuse, with a State highway running close to the grounds of the club. It is the intention of the club managers to keep the club open Summer and Winter and operate an auto bus line between Oneida and Lewis Point for the convenience of the members. Plans also call for the purchase of additional ground for a golf course.

* * *

"SHIPS—SHIPS—SHIPS"

The Durkee factory is having several additions made thereto, owing to the ever-increasing demand for ship and boat hardware, and when the new buildings and storage facilities are completed, in another six weeks, the original capacity of the plant will be trebled.

This is the third big addition made to their Grasmere plant in the last three years.

The mop and broom factory has been transferred to Grasmere to make room for space needed at the New York plant, as the output of the machine shops and flag factory call for more room to meet the increased demands on them.

Port lights, deck plates and cabinet hardware and other Durkee specials are keeping all hands busy at the Staten Island factory and it looks as if there will be no let-up all Winter.

* * *

THE LYONS FAIR

Show of Catalogs Will Take the Place of Products

The American Consul at Lyons, France, has written to The Merchants' Association to attract the attention of its members to the Sample Fair of Lyons, which will be held during the first two weeks of March, 1918.

The Consul says that while it is far preferable for American manufacturers to make an exhibit of their products, he realizes that under existing conditions many difficulties would have to be overcome in order to get the merchandise to Lyons for exhibition purposes. In view of this condition the Consul, last year, held a Consular Catalog Exhibit.

This was made in two large booths which were rented in a prominent section of the Fair and filled with American catalogs properly arranged and indexed. These catalogs were freely consulted by visitors to the Fair, and the Consul says that the actual demand for American goods from this catalog exhibit of American manufacturers amounted to more than $50,000,000.

* * *

YACHT COLUMBIA FOR SALE

The old America's Cup Defender Columbia, which was challenged in 1871 by the British yacht Livonia, was hauled out at the Redman-Vane Shipbuilding Company's yard, Baltimore, recently. This vessel was built at the Roach yard, Chester, Pa., for Franklin Osgood. Her next owner was J. H. Flagler, who in 1906 sold her to Lester Wallack. Her present owner is Chas. A. Tucker, of Baltimore. The dimensions of this historic vessel are: Length 114 ft., breadth 26 ft., depth 8 ft., and when in racing trim she carried 14,000 square yards of canvas and a crew of fifteen men. She is being offered for sale for the merchant service.

* * *

NEW NAVIGATION SIGNAL

A young Ecuadorian naval officer has recently invented an automatic alarm for navigating purposes, which serves to notify the master of a vessel of any deviation of the course, and thereby preventing accidents that might occur through negligence of the person at the wheel.

A test of the system was made in the Guayaquil Harbor recently on the national gunboat Patrial, in the presence of a number of interested people, which proved in every manner successful.

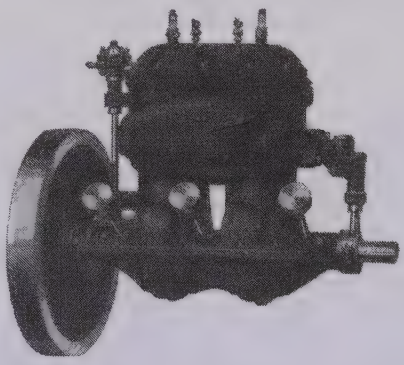
Eagle Marine Engines

This Company has specialized for eighteen years on two-cycle Marine Engines for pleasure and working boats. The product during these years has progressed with the demands, and today Eagle Engines are as near perfection as experience and modern manufacturing equipment can make them.

Our line covers every requirement for boats up to 25 feet in length of the pleasure and working models, and in our offering you can find an engine that will meet your exact requirements.

As "Eagle" Engines are sold through established dealers throughout the world, the service possible under these conditions is of considerable importance to the user.

It's not too early to arrange for 1918 agencies at this time. We are always pleased to give applications our prompt consideration.



Catalog free upon request

THE TORRINGTON COMPANY
STANDARD PLANT
TORRINGTON, CONN.

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Heavy-Duty Crude Oil Engines



Positive Governor Control from no load to full load. Will run idle any length of time and pick up full load instantly without losing a single impulse. You carry only one kind of fuel (crude oil), which is used for starting and operating. Built in sizes 60 h.p. and up.

Kahlenberg Standard Engines

in medium and heavy-duty types are made in sizes from 2 to 54 h.p., and we would strongly recommend them for operating on *Kerosene, Solar Oil* and *Gas Oil*. You ought to know more of the exclusive advantages the Kahlenberg offers you.

Write today for catalog and booklet "What Users Say."
KAHLENBERG BROS. CO.
Main Office & Factory, 1708 12th St., Two Rivers, Wis., U. S. A.

SILENT VALVE DRIGGS

A Marine Engine which combines Silence and Power

Incorporates a silent and thoroughly efficient rotary valve which is always gas tight and silent and can never stick.
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including Producing Gas Plants
By Gardner D. Hiscox, M. E.
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THE RUDDER PUBLISHING COMPANY, 254 W. 34th Street, New York

Koukokusha ni otegami onsashidashi no saiwa doso RUDDER nite goran no mune onkakisoe negaimasu

THE STERLING F-300

The Model F, 8-cylinder, 300-h.p. Sterling engine, with a bore of 6¾ in. and a stroke of 9 in., develops its power at 1,000 r.p.m., and has been so designed and built that it will run for long periods at that speed. The great volume of power generated by this engine is attained with perfect evenness, little noise, and a vibration scarcely perceptible, giving large cruisers the speed of a turbine with an economy denied the steam-driven boat. The design, construction, and heavy working parts guarantee its ability to stand up perfectly at high rate of speed for long distances.

The engine is built to operate at the speeds best suited to the lines of the hull. If it is desired to have the engine turn at 600, 800, or 1,000 r.p.m., it is built to run with the entire engine and accessories adjusted for the selected speed. In the matter of r.p.m. at which the power is developed, this engine conforms to U. S. Naval recommendations, which specify full power at not to exceed 1,000 r.p.m. Owners of boats, notably the Susanne (S. P. 411), and Whippet (S. P. 89), now in patrol service, have had no difficulty in having their craft accepted for the service.

The F-300 engine is built with double inlet and double exhaust valves, permitting a large volume of gas to enter the cylinder, filling it to its full capacity and displacing the burned gas more readily and rapidly. In an engine of such high power, double valves are more efficient and durable in that they permit a smaller valve. Where large single valves would quickly burn out from the tremendous heat, smaller twin valves cool quickly and retain their shape and efficient seating.

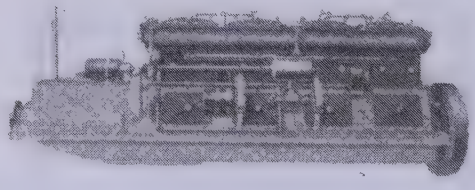
The upper base is cast of manganese bronze of special analysis—a practice original with Sterling in the marine field. The metal has an exceptionally high tensile strength. The lower base may be cast, at the option of the purchaser, either of the finest grade aluminum or auto analysis semi-steel. With an aluminum lower base the engine weighs 5,000 lb; with an iron base 5,600 lb. The choice should be left with the designer of the boat. The engine is not extremely light in weight, but has been designed for real marine service. Owing to the special A-frame construction of the upper base (on which patents have been allowed) and the suspension of the crank case in this member, a far greater strength and rigidity is possible than with the usually constructed base of high-powered engines, which divides the crank-shaft center line. In addition, it permits large hand-hole plates and gives greater access to the bearings. Particular attention is invited to the practice of suspending the crank shaft in the upper base—a feature of Sterling engines.

Ignition is furnished by two independent systems, either of which will run the engine separately. A complete electric starting and charging system are included as part of the regular equipment of this engine, and it is the practice of the Sterling Engine Company to include a generous equipment of accessories.

The lubricating system is also worthy of attention. Lubrication is accomplished through holes drilled in the crank shaft, the oil being pumped to each and every bearing under strong pressure. There is a serviceable device for cooling the oil, maintaining it at its most efficient temperature.

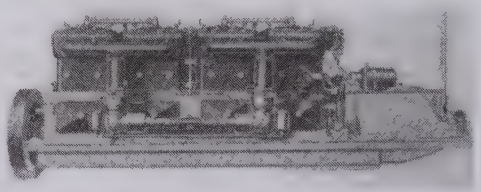
The features enumerated are novel and a departure from the usual.

The parts for Sterling engines are machined to within ½ of 1,000 of an inch of accuracy. The testing in all cases is most rigorous and severe, the 300-h.p. engine being tested from six to ten days in order that the bearings will be properly worn and a perfect engine assured.



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Two of these wonderful engines form the power plant of the Whippet (S. P. 89), the famous twin-screw 73-footer belonging to Mr. Oliver Gould Jennings, of New York. Whippet on her trials ran wide open for practically three days—a new hull and a new power plant. The desire for greater speed has led Mr. Daniel Good, of Buffalo, N. Y., to install two of these engines in his 110-foot Elmasada II. Conejo, the twin-screw



express cruiser, owned by Mr. Roy A. Rainey, of New York, designed by Mr. Albert S. Chesborough, Bristol, R. I., and built by the George Lawley & Son Corporation, is powered with a pair of Model F, 300-h.p. Sterlings. A new patrol cruiser, designed by William Gardner & Sons, for a group of twelve Yale students, will be powered with two of these engines, which have been a bonafide success in every boat in which they have been installed.

* * *

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Commodore Harry W. Parsons, of Cleveland Y. C., wrote the following letter to L. W. Ferdinand Company, of Boston, American Agents of Jeffery Glue:

The No. 1 Extra Quality Jeffery's Marine Glue, which has been used this Spring on my 85-ft. yacht, Mahapa II, for paying the seams of the new deck, has proved very satisfactory and is in our opinion the best product for this purpose on the market. We have used Jeffery's Marine Glue on our other yachts both as a seam composition and for laying canvas decks, and it has always proved very durable and satisfactory.

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* * *

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The following letter received by U. S. Vaporizer Company tells an interesting story—one that builders of large and small powered gasolene engines could investigate to advantage with the present high cost of gasolene:

(COPY) Hardin, Ill.

U. S. Vaporizer Co.,
Boston, Mass.

Gentlemen:

I received the vaporizer all right and have got it all connected on the engine and gave it a pretty good trial. The engine seems to run on coal oil just as good as it does on gasolene.

I have not got this engine in my boat at present and will not get to try it out good for a while yet.

I have got an oil engine in my boat now but it is only 30 h.p. While it is a very good engine, the 60-h.p. Standard drives my boat faster and I like that, but it burned up so much gasolene that I was compelled to get an oil engine, so I bought a —— engine, but I believe that your vaporizer will put the old Standard back in commission again.

I would like to know what kind of a carbureter is best suited for the vaporizer. I have got an old Model D Schebler, and I would like to know if there is a carbureter better suited for the vaporizer as I want to get it all lined up in good shape before I put it back in the boat again. I remain,

Yours very truly,

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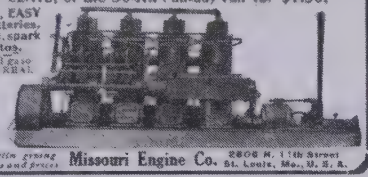
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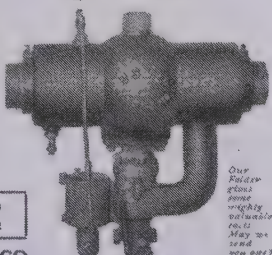
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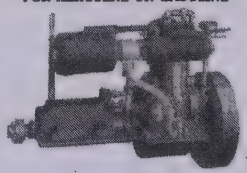
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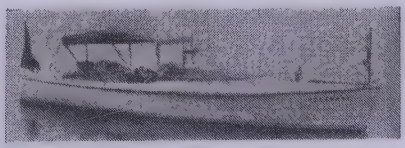


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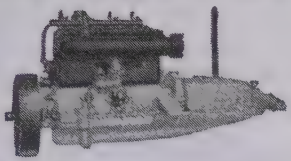
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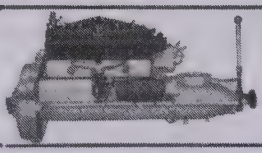
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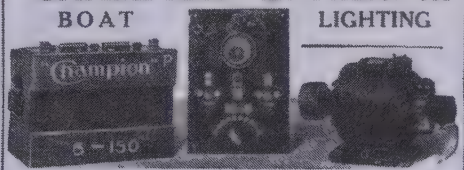


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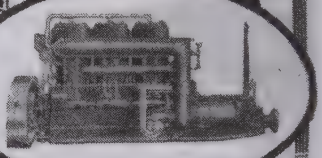
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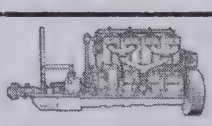
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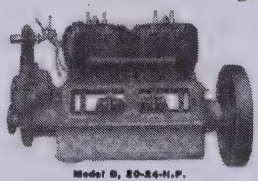
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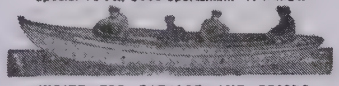
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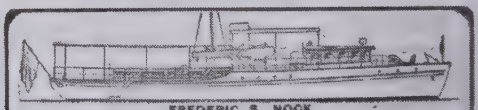
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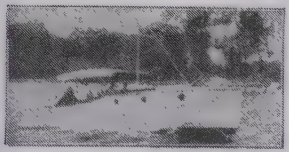


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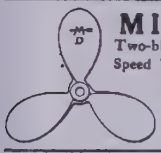
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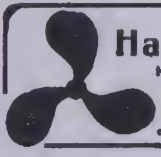
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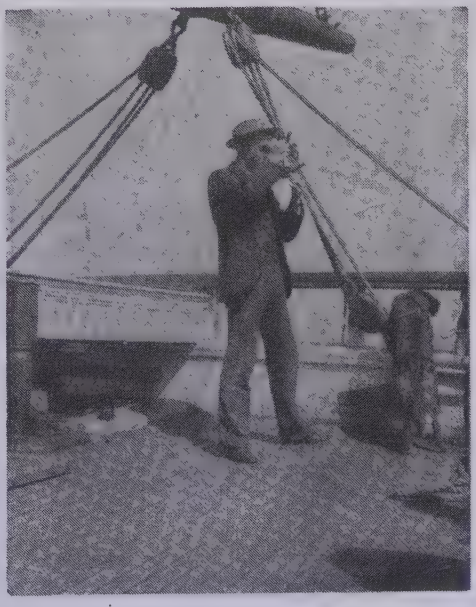
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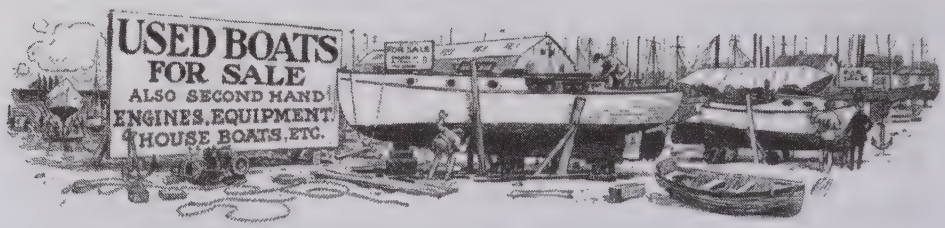
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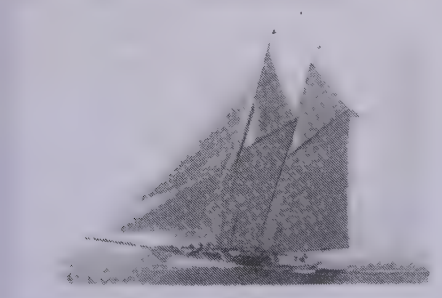
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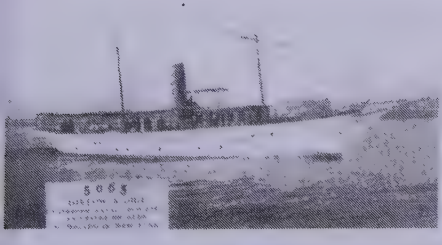
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In addition to the conversion of yachts for the service of our Government—Mine Planters are also under construction.

Notwithstanding the present active constructional work going on in our Basin our Yachting Patrons can rest assured that their interests will be as carefully looked after in the future as in the past.

We are able to offer For Sale and Charter a large list of desirable Yachts of every size and type. Now is the time to arrange for Buying or Chartering your boat for Florida waters. The demand last season exceeded the supply and similar conditions will likely prevail next Winter. A number of very fine Gasolene Houseboats listed at attractive prices. Send for Illustrated Yacht List.

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STANLEY M. SEAMAN, Yacht Broker

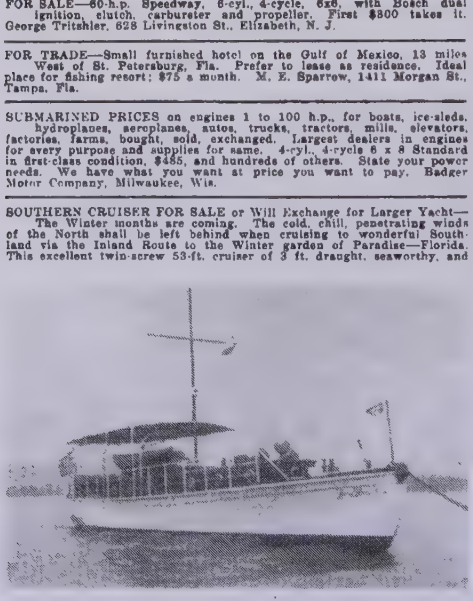
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FOR SALE—60-h.p. Speedway, 6-cyl., 4-cycle, 6x6, with Bosch dual ignition, clutch, carburetor and propeller. First $300 takes it. George Tritshler, 628 Livingston St., Elizabeth, N. J.

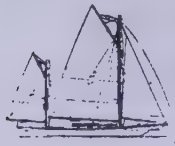
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SUBMARINED PRICES on engines 1 to 100 h.p., for boats, ice-sleds, hydroplanes, seroplanes, autos, trucks, tractors, mills, elevators, factories, farms, bought, sold, exchanged. Largest dealers in engines for every purpose and supplies for same. 4-cyl., 4-cycle 6 x 8 Standard in first-class condition, $485, and hundreds of others. State your power needs. We have what you want at price you want to pay. Badger Motor Company, Milwaukee, Wis.

SOUTHERN CRUISER FOR SALE or Will Exchange for Larger Yacht—The Winter months are coming. The cold, chill, penetrating winds of the North shall be left behind when cruising to wonderful Southland via the Inland Route to the Winter garden of Paradise—Florida. This excellent twin-screw 53-ft. cruiser of 3 ft. draught, seaworthy, and



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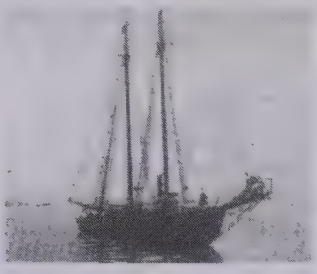
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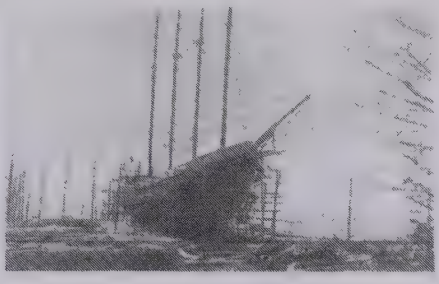
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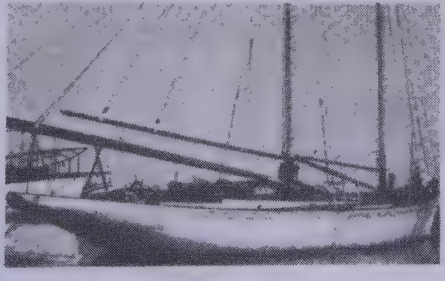
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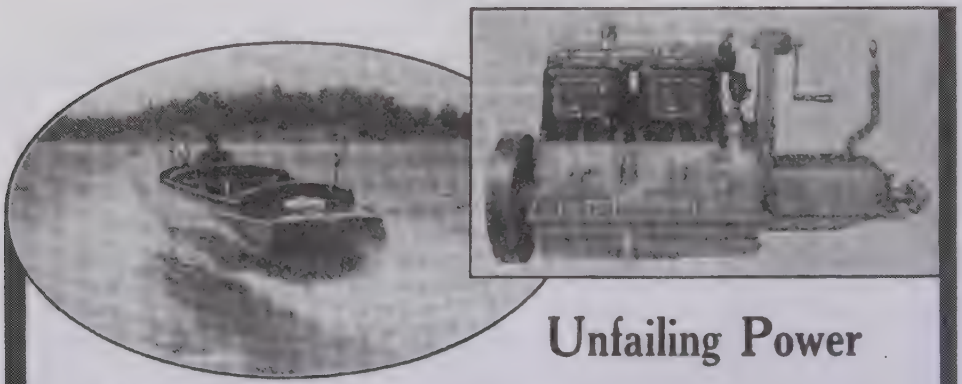


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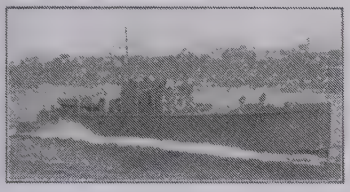
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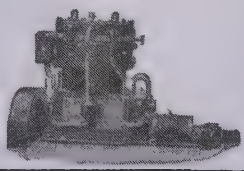
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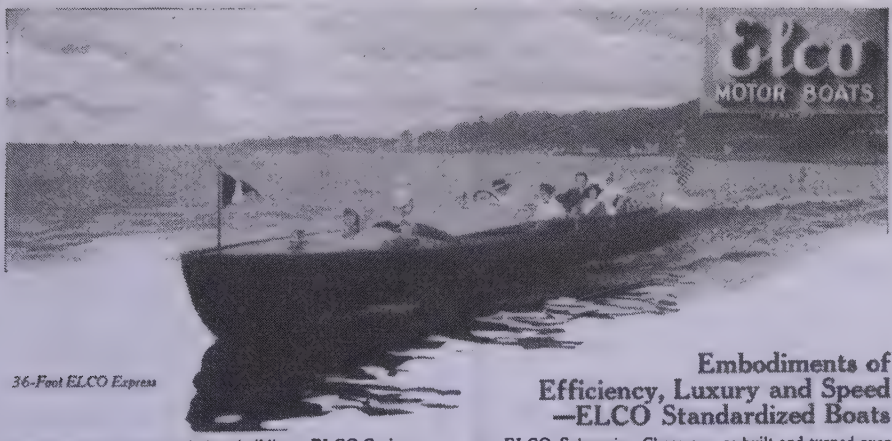
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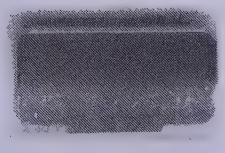
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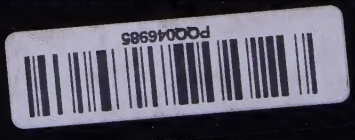
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